MAR. 25 1960

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

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A Natrona County, Wyoming water flood operator almost tripled water production from a supply well. The increase was from 35,000 to 95,000 bwpd.

A Lea County, New Mexico operator used a $410 acid job to make a 100 bopd producer out of a well that had gone dead during workover.

In recent months the success ratio of engineered acidizing treatments by Dowell has been higher than ever before; treatments have been unusually profitable to operators. You, too, can take advantage of the added degree of skill and experience offered by the company that originated inhibited acidizing.

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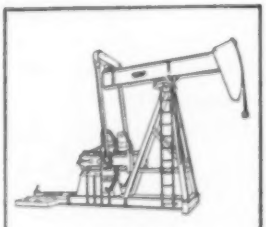

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INSIDE *Slant*

'QUOTA PROFITS' NOT LARGE

The feeling generally in the petroleum industry has been that the inland refiners are reaping great profits from exchanges in import quotas.

But a typical inland refiner says this isn't so. Neither is it so, in the refiner's opinion, that the inland plants are using their quotas for the purpose of increasing runs and subsequently cutting prices on products.

The refiner points out that in most instances where the quota was traded to a coastal refiner in exchange for domestic crude, the inland refiner has been able to dispose of the crude formerly being utilized.

In this way, the inland refiner has been able to maintain his relative position without the need to run additional crude through his plant.

The decreased cost to the inland refiner, based on his over-all crude purchases, generally figures out to be around 10¢ per bbl.

Such a reduction in his over-all operating costs would reduce the cost of his products by approximately ½¢ per gal.

As a result, says the inland refiner, there is no need to dump products at depressed prices.

LeRoy Menzing
EDITOR

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60-Second Summary / WHAT'S HAPPENING IN OIL

March 25, 1960

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Exploratory drilling and discoveries declined in the U. S. again last year, but the oil-finding rate increased slightly. The American Assn. of Petroleum Geologists reported 13,191 tests, of which 7,031 or 53.3%, were rank wildcats. . . . p. 11

•

President Eisenhower says he's ready to back a natural gas bill in this session "with full vigor." But, he adds, congressional leaders must indicate they're ready, too. . . . p. 14

•

The Soviet Union does not intend to disrupt world oil markets with price-cutting tactics, a top oil official claims. But he says Russia will continue to export. . . . p. 44

•

"Tankless terminals" are enabling Standard Oil Co. (Ind.) to cut costs and speed tankwagon deliveries. The system permits truck drivers to tap pipelines, and draw off their orders. . . . p. 52

•

An analog model of a sedimentary basin may lead to a better method of predicting producibility. It's being used by Sinclair researchers to study oil and gas movements. . . . p. 22

•

Enrico Mattei's ENI, Pan American, Cities Service, and the Japanese are early negotiators for offshore Kuwait oil rights. The area is regarded as one of the choicest. . . . p. 44

•

Survey problems in Alberta's vast Foothills region are being simplified with a cost-cutting control system. In addition, greater accuracy is anticipated, reducing the chances of "off-target" penalties. . . . p. 28

•

CATC lawyers feel they have justified a price of 21.4¢ per Mcf. for offshore Louisiana gas. Evidence presented to FPC filled every gap cited by the U. S. Supreme Court last June. . . . p. 13

•

Polyethylene film can be strengthened with a new irradiation process, according to W. R. Grace & Co., which says the new film is ideal for food-packaging. . . . p. 40

•

Estimates by major companies show that current stocks are about 70-million bbl. too high. But their own stocks—equal to 80% of U. S. stocks—are only 21-million bbl. in excess. . . . p. 15

•

Polyethylene pipelines performed well as gathering lines for oil and gas, according to a Phillips Petroleum test report. . . . p. 48

Up to the Minute / SIGNIFICANT LATE NEWS

AT-A-GLANCE PETROLEUM WEEK Copyright

March 25, 1960

The chronic oversupply of crude was reflected in a cutback in purchases by one company and price reductions by two others this week. Sinclair Crude Oil Co. started prorating its crude purchases to 60% of its January take in the Denver-Julesburg basin of eastern Colorado and western Nebraska, and to 80% of January runs in Kansas and New Mexico. The cutback amounts to about 14,000 b/d.

Price cuts hit heavy Refugio crude in Southwest Texas and one field in Mississippi. Suntide Refining Co., effective Mar. 22, reduced heavy Refugio crudes 10¢ and 15¢ a bbl. to a new top of $2.97 a bbl. for 26-gravity. The cut affected 7,800 b/d in 17 fields in Refugio, Victoria, and San Patricio counties. Esso Standard division of Humble Oil & Refining Co. trimmed 10¢ from its posting for Soso field segregated crude in Mississippi, to a top of $3 a bbl. for 40-gravity. The cut affected about 3,100 b/d.

In Louisiana, a Texas refiner has closed a deal to buy 36,000 bbl. of coastal crude at 20¢ under posted price. The crude, which carries a posted price of $3.30 a bbl. had been shut in for lack of a market.

•

Humble Oil & Refining Co. is set to move into the Ohio market—its 38th state—and possibly with a new brand name. A company spokesman indicated a new brand name would be tested in Ohio before it starts operations. Product supply will come from the Esso Standard division's Baton Rouge (La.) refinery.

•

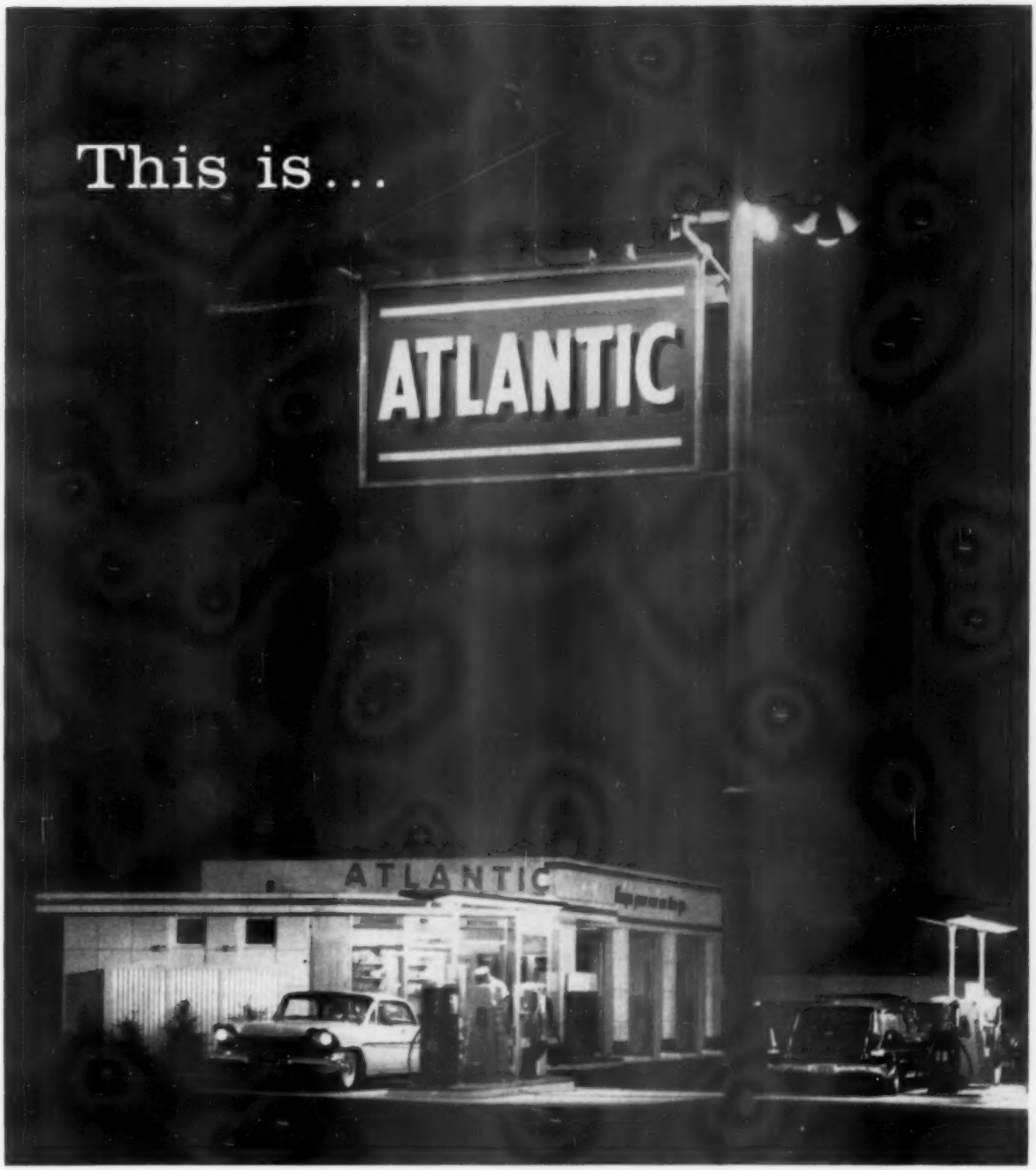
Two first-quarter earnings estimates provided a study in contrasts. Gulf Oil Corp. indicated its first-quarter earnings would be up 20%, primarily because of peak production of U.S. and Kuwait crude. Standard Oil Co. (Ind.) predicted its first-quarter earnings would be lower than in 1959, due primarily to weather and depressed prices.

•

A House committee has set its sights for an attack on Federal Power Commission Chairman Jerome Kuykendall. He admitted before the Interstate & Foreign Commerce Committee this week that he met privately with a representative of Tennessee Gas Transmission Co. last year before FPC decided an application by its subsidiary to import Canadian gas. He was urged to approve a 7% rate of return for the company, Midwestern Gas Transmission. FPC last Oct. 31 ordered an "open end" return, with the exact rate to be fixed after Midwestern completed its financing. Kuykendall agreed that changes were made in the staff recommendations—including a proposed 6¼% return—but not because of his informal contacts.

•

The Eisenhower Administration dealt a blow to the coal industry's hopes for a national fuels policy this week. Under Secretary of the Interior Elmer Bennett said the congressional study sought by coal "may be fraught with undesirable or even dangerous aspects." Interior, he said, favors free market competition.



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DEPT/Opinions

Views Tha

"Unless demand for refined products recovers rather soon to the levels that had been anticipated by most observers of the industry, the outlook for an improvement in domestic drilling must be regarded as questionable."

—H. N. MALLON
Chairman
Dresser Industries, Inc.

"In a democracy, every segment—including private industry—is constantly being judged by all the voters. In the final analysis, the future of our American industrial system, and of our individual companies in it, is determined by the general public's attitude. Undoubtedly, many of the troubles faced by our industry today can be traced to misunderstandings which grew out of a lack of information on the part of the general public. In the end, these misunderstandings, and the resulting dissatisfaction, find their way to the ballot box or to the legislative halls. Then it is sometimes too late for corrective measures. The industry finds itself attempting to treat an ill when the real solution should have been an early prevention."

—RAY H. HORTON
President
Humble division of Humble Oil & Refining Co.

"Unfortunately, we have not made . . . progress in developing our reserves of this thing called 'understanding' . . . Consequently, we are somewhat crippled when it comes time to face issues. It is no understatement to say, categorically, that profits depend in large measure on how well companies and industries face up to issues and are understood, accepted, and supported by their employees and the public."

—HOWARD G. VESPER
President
Standard Oil Co. of California, Western Operations, Inc.

. . . and Letters

Dear Sir:

In your "Views That Make News" (PW—Mar.11'60,p9), you published a letter from Mr. Frank T. Nelson, in which Mr. Nelson commented upon an earlier letter written by Mr. A. O. Malmberg.

The fact that Mr. Nelson does not agree with Mr. Malmberg's assertion that oil company executives are overpaid does not bother me. The thing that does bother me is the reasoning

Make News . . .

behind his conclusions. To me that is dangerous and false logic.

Mr. Nelson tries to prove his point by pointing out how little it would cost a stockholder to pay his proportionate share of a $500,000 salary, and goes on to say that such a contribution would hardly be felt. Can you see the parallel between the above and every proposal we have before us to raise taxes? Take for instance the rise in the federal gasoline tax. The thing we have pounded at us is the fact that it will only cost the average motorist a few cents a month. The tendency is to agree that such a small amount won't break us and is hardly worth fussing about. Nothing is said about how high the tax is already or that already, percentagewise, gasoline is overburdened with taxes.

Mr. Nelson, I think, could have come nearer to proving his point on the basis of responsibility. If a man ably runs a multi-multi-million-dollar corporation, he deserves the salary he receives—not because it doesn't cost individual stockholders much, but rather because it is sound business for the individual stockholder. Of course, the key to the above statement is "ably". Let's put values on their true basis of worth and be on the lookout for these little "wrongs" that aren't going to hurt us too much.

J. P. EVERETT
Oil & Gas Dept.,
Hibernia National Bank
New Orleans

Dear Sir:

I was interested to see that the Joseph Reisler, who wrote the thoughtful letter which appeared in your "Views That Make News" [PW —Mar.4'60,p4], is a local retail representative for Gulf Oil Corp.

Too few local retail representatives make the effort to keep informed on broad industry problems by reading the oil trade press. We would have fewer dealer relations problems if more of them followed Mr. Reisler's excellent example.

A. J. RUMOSHOSKY
Director, marketing division
American Petroleum Institute

PETROLEUM WEEK *will publish reader comments each week. Address letters to LeRoy Menzing, Editor,* PETROLEUM WEEK, *330 W. 42nd St., New York 36, N. Y.*

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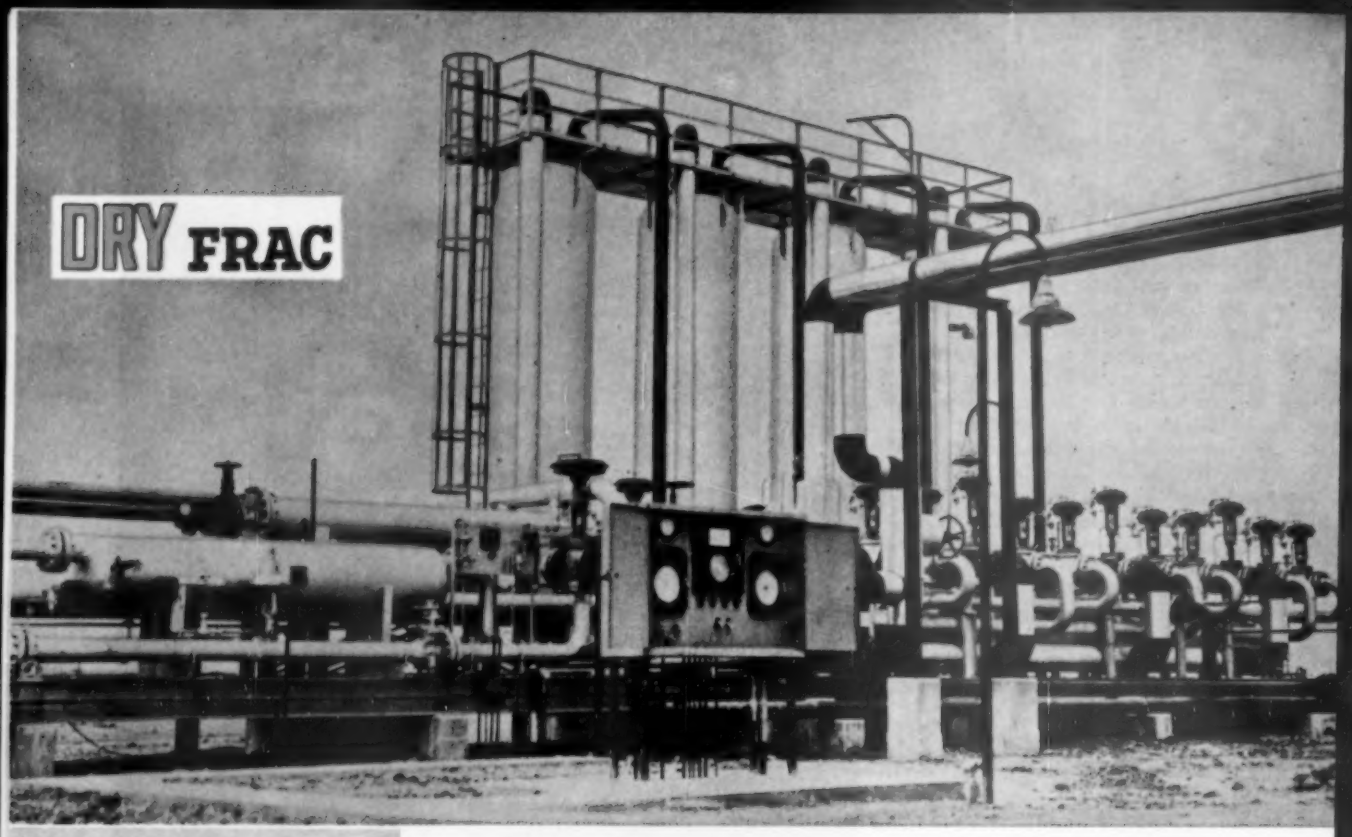

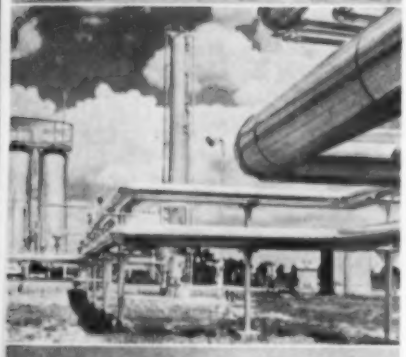

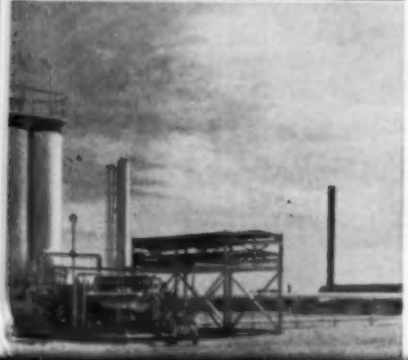

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ANOTHER STANDARD OF PRODUCT LEADERSHIP

Exploratory Drilling Dipped in '59

Only 13,191 exploratory tests of all types were drilled in the U.S., but rank wildcats increased slightly to 7,031.

The success ratio improved some to 19.83%, and the oil-finding rate rose to 14.8 bbl. of liquids per foot drilled.

In Canada, exploratory drilling gained, and the success ratio was up sharply.

Year	Total exploratory tests	Success ratio, percent	Strict wildcats drilled for oil	Bbl. of liquids found per ft. drilled
1947	6,775	20.34%	3,155	37.8 bbl.
1948	8,013	18.25	4,041	26.1
1949	9,058	20.20	4,164	57.6
1950	10,306	19.54	4,991	29.7
1951	11,756	18.86	5,861	17.5
1952	12,425	18.78	6,318	18.8
1953	13,313	20.13	6,408	21.8
1954	13,097	20.68	6,777	20.3
1955	14,937	20.78	7,477	15.1
1956	16,173	19.13	8,137	14.3
1957	14,707	19.11	7,464	14.9
1958	13,199	19.46	6,382	13.4
1959	13,191	19.83	6,387	14.8

Exploratory drilling declined in the U.S. in 1959 for the third consecutive year, with only 13,191 tests of all types completed.

The slight decline from the 13,199 exploratory tests drilled in 1958 was reported this week by the Committee on Statistics of Exploratory Drilling of the American Assn. of Petroleum Geologists, of which B. W. Blanpied, of Shreveport, La., (picture) is chairman.

Total footage drilled in 1959 in exploratory tests of all types—new-field wildcats, new-pool tests, and outposts—amounted to 63,252,521 ft., up 2.8% over 1958.

The average depth increased 3% over 1958 to a new record of 4,800 ft. per exploratory hole.

No major field—one with ultimate reserves of 50-million bbl. or more—was discovered last year. But one 1956 discovery was raised to major, or class "A" status.

The exploratory results last year improved to the extent that three "B" fields were found, compared to only one in 1958.

Under the AAPG classification, a "B" field is one with ultimate reserves between 25-million bbl. and 50-million bbl.

Perhaps more important, the AAPG committee, after reviewing its estimates made in 1957, raised one "E" field (less than 1-million bbl.) discovered in 1956 to "A" rank—the first since 1953.

Also one "C" field (10-million to 25-million bbl.) was raised to "B," and one "D" was rated as "B."

The over-all large discoveries in 1959 show that 16 "A-B-C" fields were discovered, compared with 11 (as revised) in 1956 and 40 in 1953.

Last year, 19.83% of the total exploratory holes drilled and 23.07% of the footage drilled were successful. The success ratio, in terms of holes drilled (table, above) was the best since 1955.

It was also slightly above the 1944-1959 average of 19.7%.

In terms of footage drilled in all exploratory tests, one producer-foot was drilled for each 3.33 ft. of dry hole, the same ratio as in 1958.

Of the 13,191 exploratory tests drilled, 7,031 were new-field wildcats, 3,355 were new-pool tests, and 2,805 were outposts. Of these, 2,614 were successful tests, compared with 2,567 in 1958.

B. W. BLANPIED, a geological consultant for Gulf Oil Corp. following his recent retirement, is chairman of the Committee on Statistics of Exploratory Drilling of the American Assn. of Petroleum Geologists, which prepared the drilling data.

Of last year's success, 1,702 were oil, 644 were gas, and 268 were condensate. In 1958, the successes were 1,745 oil, 568 gas, and 254 condensate.

Strict wildcats—new-field tests—accounted for 53.3% of all the exploratory tests last year, up slightly over 1958. But the new discoveries were the lowest since 1952.

Of the 7,031 rank wildcats drilled, 772 made new discoveries, for a success ratio of 10.97%, a decline from 11.32% in 1958.

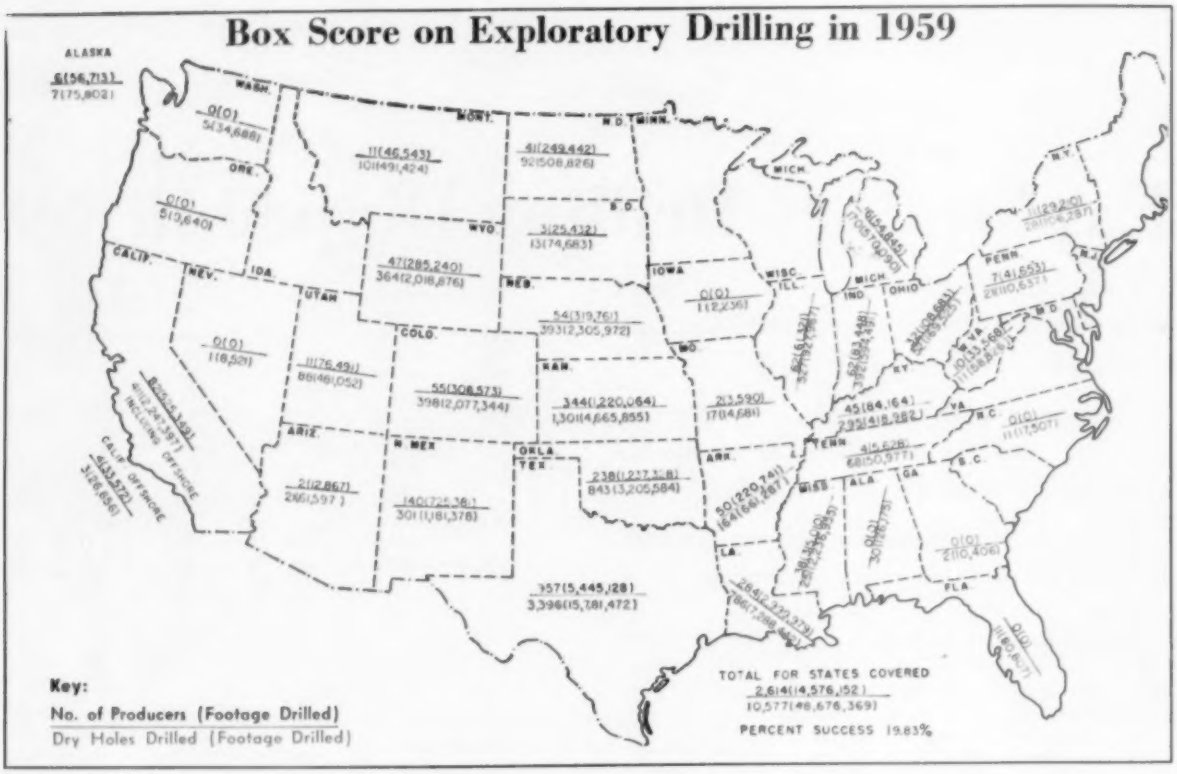
The total footage drilled in new-field wildcats rose 3.6% over 1958 to 35,459,205 ft., and the average depth per hole increased 2.6% to 5,048 ft., a new record.

The decline in the number of, and success ratio of, new discoveries was offset somewhat by a gain the oil-finding rate.

The indicated finding rate of liquid hydrocarbons per foot drilled in strict wildcats last year was 14.8 bbl. per ft. (table, above), up from 13.4 bbl. per ft. in 1958. But last year's rate was still well below the postwar average of 23.2 bbl. per ft.

The oil finding rate was computed by PETROLEUM WEEK by deducting the gas producers from the total rank wildcats and dividing the remaining footage drilled in strict wildcat tests into the American Petroleum Institute's estimates of new liquid hydrocarbons found during the year.

The results of the new-field tests



last year did not change the basic geological concepts that only one wildcat in nine drilled finds some oil or gas and only one of every 43 drilled finds 1-million bbl. or more of reserves.

In other words, 42 unsuccessful holes must be drilled for every profitable field discovered, according to the tabulations of the AAPG committee over the past 16 years.

The ratio of fields with 1-million bbl. or more of reserves to total new-field wildcats, the committee reported, has shown a steady increase of unsuccessful tests over the years studied.

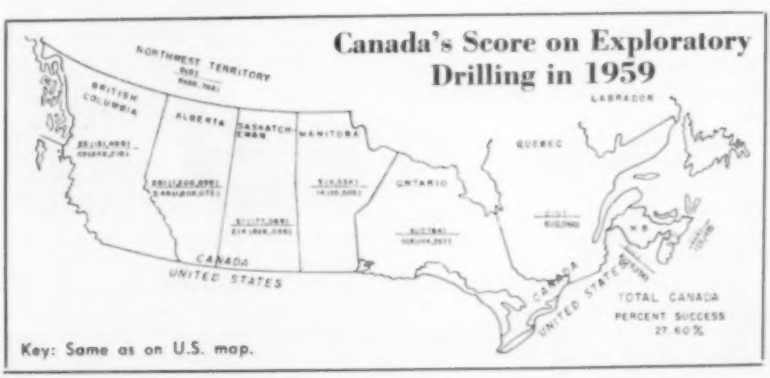
The most significant finding of the committee's study is that 98% of all new-field wildcats drilled are failures—either they are abandoned as dry, or they discover reserves too small, on the average, to be profitable.

Exploratory drilling in Canada last year increased to 1,036 tests from the 968 drilled in 1958, and the success ratio rose to 27.6% from 22%.

In Western Canada, 905 exploratory holes were completed, of which 278 were producers. The producers included 136 oil wells and 142 gas wells.

Footage drilled totaled 4,452,852, of which producers accounted for 1,515,676 ft.

Of the 661 rank wildcats completed in Western Canada, 144 were successful, for a success ratio of 21.75%.



CATC Case History Rebuts 'Cost' Rule

Offshore Louisiana group's operating data show that wellhead costs range from 25.19¢ to 43.69¢ per Mcf., depending on method used to determine costs of service.

Lawyers for the CATC group of producers believe they have fashioned an airtight case to show the Federal Power Commission and the courts the fairness of 21.4¢ plus tax per Mcf. for offshore Louisiana natural gas.

Information placed before Examiner Ewing G. Simpson last week was designed to fill every gap cited by the U.S. Supreme Court last June 22, when it sent the case back to FPC for more evidence to support the price.

The court's action marked a stringent crackdown on new prices above going area levels. Now, as case after case comes from examiners and FPC itself with initial prices cut back on the basis of the CATC decision, producers are looking to the CATC case itself for benchmarks on how to get prices above the present ceilings.

The evidence given by the CATC partners, Continental Oil Co., Atlantic Refining Co., Tidewater Oil Co., and Cities Service Production Co., was aimed at more than merely answering the Supreme Court.

Its purpose was to destroy the concept of cost-of-service as a valid criterion for judging initial prices considered "out of line."

To prove this, the producers offered a complete cost study of production from the Cameron (La.) area, and they did it to convince the commission that cost is useless in deciding if the sale is in the public interest.

In effect, the producers offered a complete case based on cost, but urged FPC to reject it in favor of the extensive showing on industry economics and the special hazards of offshore activity.

Because the CATC producers have been selling to Tennessee Gas Transmission Co. under temporary permits since July, 1958, they have the facts for a complete 1959 cost study.

Based on the expenses of Continental Oil, operator for the combine, the study showed a wellhead cost of 43.69¢ per Mcf. at 15,025 lb. pressure. This includes a 14% rate of return, and includes the tax items of depletion and intangible drilling expenses in the costs. Expenses are divided between oil and gas on the basis of heat content, a method opposed by the FPC staff.

In a second study, the FPC staff's own methods used in a recent Continental Oil rate case were applied by the CATC group.

The rate of return was pared to 9%. No allowance was made for depletion and intangible drilling expenses in costs, and expenses were split between oil and gas on the basis of proportion of income from each.

The wellhead cost still came to 25.19¢ per Mcf. at 15,025 lb. pressure.

Despite the ample margin between these two cost figures and the 21.4¢ contract price, witness after witness for the producers attacked the cost methods.

No producer who has just signed a contract has figures this complete, they said. He doesn't even know his full development costs.

Furthermore, if expenses were abnormally low or high, limiting costs to a specific area can produce absurd results by which the consumer could be hurt as much as the producer, the witnesses said.

The alternative to the CATC group's limited cost showing would be costs on a company-wide basis.

In a joint venture like the CATC group's, this would probably mean several different initial prices for gas from the same well, the producers argued.

Even worse, each certificate case would become as interminable as a rate investigation, dragging on for years and years.

This argument is expected to win favor with the commission, which is now struggling to speed its rate proceedings.

Although the producers believe their costs amply justify the 21.4¢ price, their witnesses urged the commission to consider broader economic evidence in deciding if a proposed price for new gas is out of line.

Ira H. Cram, Continental Oil's senior vice-president, sketched the history and importance of the offshore development as background for this reasoning.

He testified that, in 14 years, the industry has invested $2,594,000,000 in offshore Louisiana, and has recovered only $725,000,000 in income.

The CATC group, by the end of 1959, had spent $284,785,000, for revenue of $67,492,000, he said.

"This makes us very uneasy," Cram said, "And remember, a lot of that money has been planted out there a long, long time."

The argument that the offshore finds haven't been as prolific as believed is backed up with a sharp downgrading of CATC reserve estimates.

Recoverable CATC reserves when the Supreme Court threw the case back to the commission were pegged at 1¾-trillion cu. ft., and the contracts called for daily delivery of 240-million cu. ft.

Now DeGolyer & MacNaughton, Dallas geologists, estimate the total reserves at 697.1-billion cu. ft. at 15,025 lb. pressure. The amount available for daily delivery is put at 86.1-million cu. ft. for the next 12 years, with a decline after that.

Based on these cutbacks, John G. McLean, Financial Vice-President of Continental Oil, projected likely costs and income from gas and distillates for the life of the properties.

He estimated an 11.2% annual rate of return, based on the contract prices for the gas, and called it "disappointingly low in view of the risks."

Summing up the chief argument of the producers, Dr. J. Rhoads Foster, an economist, said that "the underlying economic forces" are the necessary criterion for judging the fairness of initial prices.

Finding the "unit cost of the specific gas supply is a practical impossibility—at the time of the certificate proceeding," he said.

Far from being "out of line", as the Supreme Court suggested, the CATC price was "accounted for by, and is in line with, underlying market and cost trends," Foster concluded.

Besides the key evidence on costs, reserves, and return, the producers also showed that the disputed price was reached in competitive bargaining, that exploration offshore costs twice as much as onshore, and that production offshore is more than three times as costly as onshore.

Whether even this is enough to satisfy the staff and interveners, such as the New York Public Service Commission and Long Island Lighting Co., will become evident on June 6, when questioning of the CATC witnesses begins.

The prospect is for a lengthy hearing battle.

Eisenhower O.K.'s Gas Bill With 'If'

President Eisenhower is "ready and willing" to support a natural gas bill now, providing "those in control of Congress" indicate they will go along with it too.

His endorsement, which came in a letter to Rep. Page Belcher (R., Okla.) was a surprise to gas bill supporters, who had all but abandoned hope of presidential backing.

Most industry observers had felt that unless the President issued a ringing call for a relief measure, there would be little likelihood of a successful campaign in the current session of Congress.

The Eisenhower endorsement, although not a forthright call for action, did put the issue squarely up to legislative leaders.

Rep. Belcher, in his letter to the White House, had asked for a presidential message to Congress urging passage of a bill to free gas producers from utility-type controls.

To this, Eisenhower replied that a "mere reiteration of my viewpoint would serve no useful purpose."

But, he went on, "I am ready and willing to support this legislation in this session with full vigor if those in control of Congress give some indication that they will join in this effort."

The President pointed out that he has always been in favor of natural gas legislation, even though he had found it necessary to veto a bill that Congress passed in 1956.

"I feel sure," he wrote, "that everyone clearly understands my position on this matter.

"I have strongly favored the elimination of public-utility-type regulation of producers of natural gas.

"Both before and since the veto of the gas bill in 1956, I have advocated legislation to this end. I still favor such legislation."

The 1956 bill, which climaxed a long drive by industry and congressional leaders to clarify the Natural Gas Act of 1938, was vetoed by the President because some segments of the industry had engaged in "highly questionable activities."

Storage Capacity Increases 35.5%

A new study by the National Petroleum Council shows that U.S. petroleum storage capacity totals almost 1.6-billion bbl., up 35.5% over the previous survey.

The council, meeting in Washington this week, formally approved the study and passed it along to the Interior Dept., together with a report on the use of radio and radar.

Both had been requested by the Secretary of the Interior.

Of the total storage capacity now available, 1.2-billion bbl. represents refined products, and 452-million bbl. crude.

Totals for storage of various products were given as follows: gasoline, finished and unfinished, 416,529,000 bbl.; distillate fuel oil, 248,946,000 bbl.; kerosine, 55,844,000 bbl.; jet fuel, 29,169,000 bbl.; residual fuel oil, 143,302,000 bbl.; and all other products, 239,448,000 bbl.

The total reported is 415-million bbl. more than was accounted for in the previous study.

NPC officials said at least 98% of the country's storage capacity is believed to be represented in the current report.

It counted all facilities—of both primary and secondary storage—having 25,000 bbl. or more, and listed 31,109 sites.

Another report, on radar and radio, lists more than 700 petroleum industry users operating over 44,000 radio transmitters, excluding microwave.

In addition, 176 gas distribution companies operate nearly 18,000 transmitters, this NPC report says.

Where microwave systems are concerned, it goes on, oil and gas users have in operation, or in the planning stage, about 27,000 mi. of microwave systems incorporating 1,200 stations.

The radio and radar report notes that the growing intensity of competition for radio channels—spectrum space—is the most serious challenge that faces petroleum industry users.

It recommends that appropriate government agencies be "informed fully" of the importance of the facilities and channels to the oil and gas industry.

Indiana Seeks More Foreign Crude

Standard Oil Co. (Ind.) is expanding overseas operations to meet its crude needs of 1-million b/d 10 to 15 years from now.

"We may not be able to produce these requirements in the U.S.," John E. Swearingen, president, told the New York Society of Security Analysts this week. "In the long run, we do not wish to be dependent on others for a major part of our supply of raw material."

And, he added, the demand for oil products in the free foreign world is increasing at about twice the rate it is in the U.S.

The company has started exploration and production activities in seven countries, and has started studies of marketing operations in Western Europe and in the Far East.

The seven countries are: Venezuela, Argentina, Iran, Libya, Algeria, Mozambique, and Italy.

A company spokesman said Indiana has reached an agreement in principle to build a refinery in Thailand.

Indiana Standard has completed an 83-mi. crude line in Argentina from its producing area to the coast.

This, Swearingen said, will permit the company to boost its crude sales to the government oil agency from 4,500 b/d to 25,000 b/d.

The company is stepping up its Persian Gulf activities.

Swearingen said it will be "several months" before the company's initial Persian Gulf wildcat in offshore Iranian waters is tested. But, he said, "we have had several encouraging shows." Another spokesman said the test had "heavily oil- and gas-cut mud." The company will drill a second test on a new structure in the near future.

Large Buyers Suggest Stocks Are High

	Gasoline		Kerosine		Distillate		Residual		Crude	
	Apr. 1	Nov. 1	Apr. 1	Nov. 1	Apr. 1	Nov. 1	Apr. 1	Nov. 1	Apr. 1	Nov. 1
24 companies estimate 'ample' stocks as	190.0	156.0	17.1	33.0	64.7	155.9	37.3	48.5	249.1	253.3
But mid-March stocks were	221.1		20.5		91.2		43.1		252.7	

—with no chance of being reduced to the 'ample' levels suggested.

The Question Is: Who Has the Surplus?

Total stocks of the 24 companies represent 80% of the U.S. inventory of crude and products. But their combined position on Mar. 1, compared with their 'desired' position shows that:

- **Their gasoline stocks are only 1.9-million bbl. too high.**
- **Their kerosine stocks are only 2.4-million bbl. too high.**
- **Their distillate stocks are only 11.3-million bbl. too high.**
- **Their residual stocks are only 2.6-million bbl. too high.**
- **Their crude stocks are 3.4-million bbl. too high.**

Two dozen of the largest oil companies, which hold about 80% of the U.S. stocks of crude and products, testified last week that current inventories are about 70-million bbl. too high.

In fact, their combined estimates of what "ample" stocks should be on Apr. 1 indicated that present gasoline and distillate inventories are in such a position as to be a serious drag on the entire industry (table, above).

That was the highlight of the testimony presented to the Texas Railroad Commission in Austin last week.

The estimates of ample inventories were provided by the buyers of Texas crude in response to a questionnaire initiated by the commission.

The averages of the estimates of ample stocks in the U.S. showed that the large buyers now prefer slightly higher inventories of gasoline and a little less crude than they suggested a year ago.

The average of the estimates for kerosine, distillate, and residual inventories were about the same as submitted last March.

But the 24 companies themselves could only account for about 21.6-million bbl. of the surplus.

Those facts result from comparing individual company estimates of what U.S. ample stocks should be on Apr. 1 with the mid-March inventory levels, and the companies' own comparisons of their Mar. 1 stocks with their own Mar. 1 "desired" inventory positions (tables, page 16).

The positions of gasoline and distillate inventories can be expected to change between mid-March and Apr. 1, but the probability is remote that any change would be for the better.

Normally, gasoline stocks—now at an all-time high—can be expected to continue to increase until the end of March. And at this time of the year, stocks of distillate usually start to rise as the end of the heating season approaches.

In fact, chances are that by Apr. 1, total inventories held in the U.S. may amount to more than the 70-million-bbl. surplus that is now indicated.

The "missing" surplus brought the large companies under attack by the Texas Railroad Commission on issues ranging from import policies to crude buying practices in other states.

Commissioner William J. Murray, Jr., noting that the combined positions of all the companies showed a surplus of only 1.9-million bbl. of gasoline on Mar. 1, said he was "mystified" as to where the remaining 35-million bbl. of surplus stocks on that date were located.

In addition to the 1.9-million-bbl. surplus position on gasoline, the 24 companies reported that as of Mar. 1 they held 3.4-million bbl. of surplus crude, 2.4-million bbl. of surplus kerosine, 11.3-million bbl. of surplus distillate, and 2.6-million bbl. of surplus residual.

The commission aimed its attack on import policies primarily at Standard Oil Co. (Ind.), which admitted that it was seeking a higher import allocation while prorating its purchases of crude in the U.S.

The company, through its crude-buying subsidiary, Indiana Oil Purchasing Co., told the commission it would end purchaser proration in Texas if the April allowable were cut to a seven-day producing schedule.

In reply to a question by Ernest O. Thompson, commission chairman, John R. Evans, Indiana's general manager of production, said the higher import quotas the company requested would "supplant" U.S. crude.

Asked if that was a good policy defense-wise, Evans replied:

"Imports should supplement, not supplant, domestic oil."

Then, in reply to a question on the "urge" to import, Evans said that the "urge is simply that [foreign crude] can be laid down in the U.S. cheaper than domestic crude."

The attack on buying practices in other states was aimed at Louisiana.

Questioned about Louisiana nominations, W. K. Whiteford, president of Gulf Oil Corp., said that nominations in Louisiana are "always considerably less" than the allowable set by the Conservation Commission. "Louisiana's allowable is lush," he added.

A. J. Ferguson, of Humble Oil & Refining Co.'s Esso Standard division, said the Louisiana allowable was 10% higher than Esso wanted.

Asked if Humble was prorating its take in Louisiana, Morgan J. Davis, president, replied: "Not yet."

A majority of the buyers of Texas crude and the independent producer groups wanted a sharp cut to an eight-day producing schedule in April, but the commission set a nine-day schedule.

The initial allowable was set at 2,814,252 b/d, a cut of 123,029 b/d from the mid-March permissible, which was based on a ten-day schedule.

In New Mexico, the Oil Conservation Commission set its April allowable at 361,698 b/d, a cut of 3,284 b/d from March.

The unit allowable in the southeast

was cut 1 b/d to 35 b/d while the unit allocation was continued at 60 b/d in the northwest.

The southeast allowable of 307,951 b/d is expected to result in production of 258,679 b/d. And the 53,747 b/d permitted in the northwest is expected to mean production of 37,623 b/d.

This week, Frank O. Prior, Indiana Standard's chairman, said the outlook would not improve until the industry "comes to its senses."

"Increasing demand," he told the New York Society of Security Analysts, "will not automatically solve the industry's problems. It will not solve one of the industry's own making—that is, manufacturing far too much product in relation to demand."

Rails Cut Rates to Lure Oil Shipments

Several railroads took steps last week aimed at recouping part of the petroleum products market that has been shifting to other means of transport.

Railroads are now in last place among the major modes of transportation in amount of products carried. At the end of 1958, their share was only 5.3%.

The most positive development was the approval by the Western Trunk Line Committee of new sliding guaranteed rates proposed by the Soo Line for residual.

The heavy fuel oil would be shipped from Superior Refining Co., Superior, Wis., to six iron mines in Upper Michigan.

Soo's current flat rate for the haul is 26¢ per 100 lb.

New proposed rates are: 24¢ per 100 lb. for shipments of 5-million to 10-million gal. annually; 22¢ for 10-million to 20-million gal.; and 20¢ for all over 20-million gal.

Actually, shipment by other means of transportation wouldn't cost any more, but would involve barge travel and then rail and/or truck transport.

In an effort to discourage shipment of LPG by the proposed Katy R.R. pipeline, at least one railroad serving the Mid-Continent has slashed its rates.

Texas & Pacific Ry. has announced a ½¢-per-gal. reduction on LPG to McPherson, Kansas City, Lincoln, Omaha, and Minneapolis-St. Paul.

Mid-American Pipeline Co., the Katy subsidiary that will build the line, says it will undercut the railroads by 2¢ a gal.

Estimated 'Ample' Crude Inventories (Millions of barrels)

Company	In total U.S. Apr. 1	In total U.S. Nov. 1	In area East of Rockies Apr. 1	In area East of Rockies Nov. 1	Of Texas Origin in total U.S. Apr. 1	Of Texas Origin in total U.S. Nov. 1	Probable Rise in Domestic Demand 1960 over 1959
Atlantic	250-260	255-265	207-215	212-218	110-115	110-115	3.7%
Cities Service	250	250	210	210	110	110	3.5%
Cosden	253	257	220	224	112	115	1.0%
Continental	247	247	213	213	91	91	3.0%
Crown Central	250	270	210	230	120	140	____
El Paso	250	260	220	230	110	114	4.0%
Gulf	240	240	210	210	105	105	3.5%-4.5%
Humble	255	255	225	225	112	112	3.0%-4.0%
Phillips	245	245	215	215	110	110	3.5%
Premier	250	250	220	220	90	90	3.0%-4.0%
Pure	252	255	224	227	108	109	4.0%
Shamrock	250	250	220	220	110	110	4.0%
Shell	250	255	220	225	110	112	3.2%
Signal	240	240	219	219	105	105	1.5%-2.0%
Sinclair	240	250	205	215	112.5	115	3.0%
Socony Mobil	251	256	218	223	108-116	110-118	3.2%
Sou. Minerals	245	255	215	225	110	115	3.0%
Stand. Calif.	255	260	240	225	105	110	4.5%
Stand. Ind.	250	250	220	220	105	105	3.0%-4.0%
Stand. Ohio	255	260	220	225	110	110	3.5%
Sun	250	255	220	225	115	118	3.5%
Suntide	250	250	217	217	107	107	3.5%
Texaco	255	255	225	225	115	115	4.0%
Tidewater	250	255	220	225	110	115	3.5%-4.0%

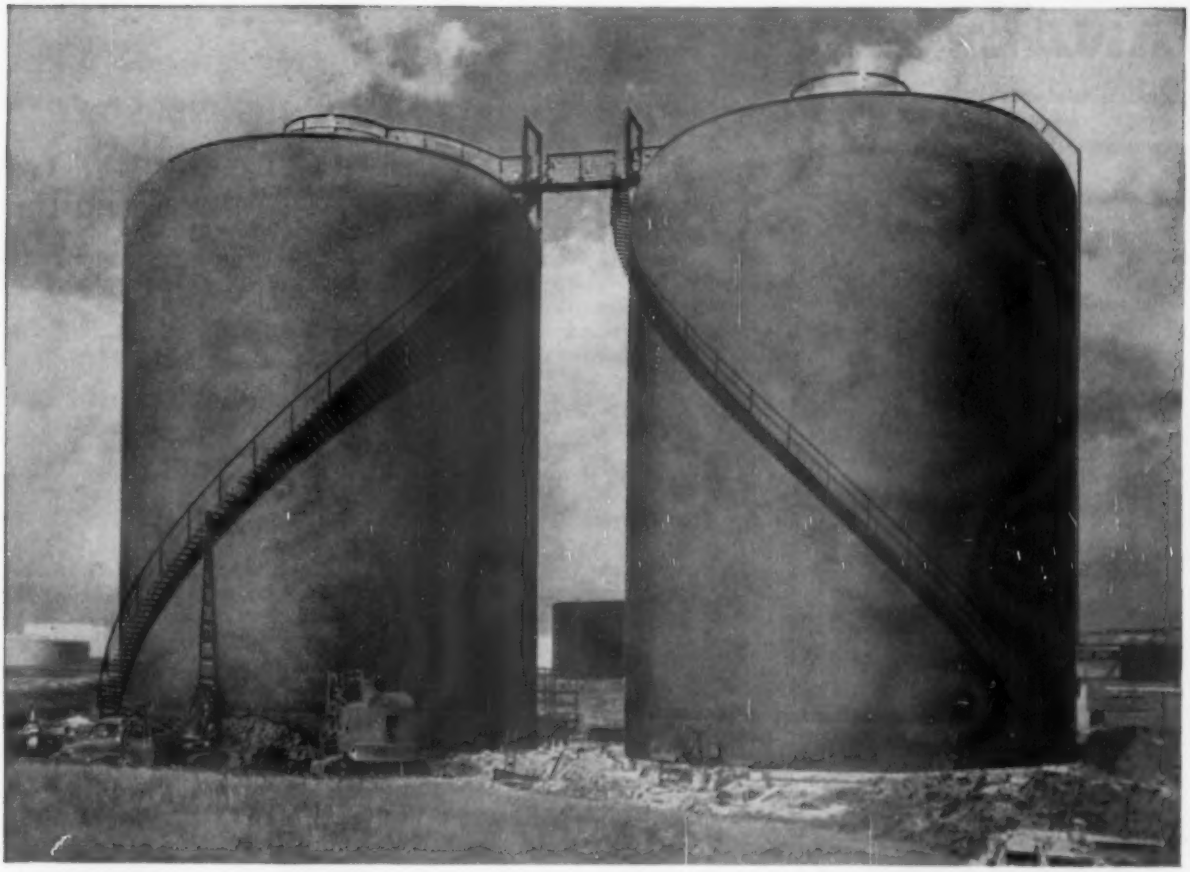
Estimated 'Ample' U. S. Product Stocks (Millions of barrels)

	Gasoline Apr. 1	Gasoline Nov. 1	Kerosine Apr. 1	Kerosine Nov. 1	Distillate Apr. 1	Distillate Nov. 1	Residual Apr. 1	Residual Nov. 1
Atlantic	200-205	165-170	18	30	65	165	34	47
Cities Service	200	168	18	35	70	160	38	49
Cosden	188	154	17	34	65	156	37	48
Continental	195	160	16	30	65	160	35	50
Crown Central	185	150	20	28	70	120	40	45
El Paso	180	150	16	32	65	160	32	50
Gulf	170	130	18	35	45	145	35	45
Humble	210	175	17	34	71	170	42	54
Phillips	180	150	16	35	65	155	36	45
Premier	165	135	12	30	40	130	25	40
Pure	195	158	17	34	68	159	39	50
Shamrock	190	150	16	30	60	160	25	45
Shell	190	155	18	38	67	162	38	48
Signal	180	140	15	25	60	125	40	50
Sinclair	194-198	160-164	18	36	70-72	160-162	38-40	50-52
Socony Mobil	198	166	18	37	66	174	38	49
Sou. Minerals	195	165	17	32	75	165	45	55
Stand. Calif.	200	163	20	40	70	161	40	42
Stand. Ind.	200	165	15	30	65	160	40	50
Stand. Ohio	185	155	18	35	65	160	37	50
Sun	185	155	17	32	65	150	40	50
Suntide	190	160	18	30	70	160	40	50
Texaco	195	160	19	37	69	163	45	57
Tidewater	185	150	16	32	65	160	35	45

Individual Company March 1 Inventories (Millions of barrels)

	Crude Stocks	Crude Above (+) below (−) desired	Gasoline Stocks	Gasoline Above (+) below (−) desired	Kerosine Stocks	Kerosine Above (+) below (−) desired	Distillate Stocks	Distillate Above (+) below (−) desired	Residual Stocks	Residual Above (+) below (−) desired
Atlantic	5.443	— .112	3.699	+ .316	.861	+ .384	2.547	+ .534	.591	— .373
Cities Service	8.474	— .022	6.776	— .224	1.104	+ .104	3.900	— .100	.684	— .066
Cosden	.449	+ .049	.810	+ .160	.013	____	.118	+ .058	.624	+ .224
Continental	5.076	+ .276	4.244	— .056	.235	____	2.630	+ .530	.612	+ .012
Crown Central	.521	+ .071	.762	+ .262	.268	+ .143	.403	+ .103	.086	+ .046
El Paso	.287*	— .036*	.465*	+ .023*	.024*	+ .004*	.059*	— .006*	.032*	____
Gulf	12.200*	—1.300*	15.400*	—1.200*	1.800*	+ .100*	8.800*	+ .700*	4.300*	—1.200*
Humble	22.682*	+ .245*	19.214*	— .186*	2.484*	+ .784*	11.334*	+1.034*	2.834*	— .266*
Phillips	2.346	+ .138	9.434	____	.568	____	4.375	+1.213*	.116	+ .011
Premier	.290	— .010	.200	— .040	.018	____	.032	+ .012	.025	— .015
Pure	5.205	— .955	4.725	+ .141	.774	+ .014	.987	+ .145	1.077	+ .227
Shamrock	.100	____	.941	+ .091	.001	— .009	.087	+ .027	.148	+ .023
Shell	16.775	+1.285	16.790	— .610	2.470	+ .410	6.390	+1.180	2.190	+ .050
Signal	.685	— .165	1.288	+ .483	.095	+ .040	1.141	+ .766	.845	+ .395
Sinclair	16.187	+1.187	9.188	+ .288	1.039	— .011	5.287	+ .037	2.018	+ .118
Socony Mobil	19.403	+ .140	16.376	+ .860	1.581	+ .121	9.847	+1.146	2.274	— .235
Sou. Minerals	.557	+ .107	____	____	____	____	____	____	____	____
Stand. Calif.	10.767	+ .450	11.830	+1.375	.453	____	5.830	____	8.743	+3.050
Stand. Ind.	29.900	+1.900	20.361	+ .142	2.512	+ .283	6.286	+1.868	2.132	+ .142
Stand. Ohio	5.600	+ .100	3.200	+ .100	.600	____	1.500	____	.200	____
Sun	6.444	____	4.952	____	.149	____	2.106	+ .700	.828	____
Suntide	.513	+ .253	.655	+ .380	.007	+ .002	.701	+ .551	.111	+ .111
Texaco	20.807	— .293	17.628	— .572	9.469**	____	____	____	6.207	____
Tidewater	4.367	+ .104	4.781	+ .341	.304	+ .019	4.429	+ .803	1.137	+ .337

*Excludes West Coast. **Includes distillate.



Two Beauties for Butadiene

"Cool" is the word for these ellipsoids . . . they're built to store butadiene at just-above freezing temperatures, which in Texas means about 45° below ambient temperature. They're 60 feet in diameter and 62 feet high, with storage capacity of 40,000 barrels each.

Butadiene is a problem child when it comes to storage. Vessels must be cold-storage as well as safety-vaults. Operating in an ambient temperature of 80° F the butadiene liquid in these twin ellipsoids had to be refrigerated to 35°F at 10 psig so that it could be kept "indefinitely."

At higher temperatures butadiene will deteriorate. Four inches of glass fiber insulation help maintain the low storage temperature to guarantee the quality of the butadiene.

It takes a heap of know-how and experience to build tanks that meet such stringent requirements. We are proud to have been given the opportunity to build these two ellipsoids for Hess Terminal at Galena Park, Texas.

For any type of process vessel made of metal plate, consult the Pittsburgh-Des Moines Steel Company.

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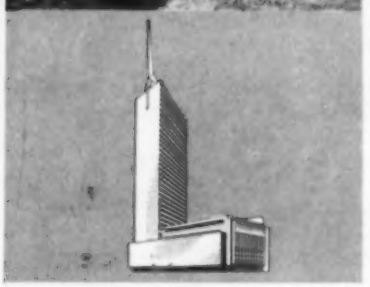

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What's New / IN THE INDUSTRY

A toxic additive that will take care of free-loading microbes in jet fuels is being sought by scientists in the Naval Research Laboratory, in Washington.

A report by Dr. John M. Leonard says the microbes have voracious appetites, but that isn't the principal problem. It's the clogging effect the bugs have on storage facilities and in the aircraft themselves that creates an unhappy situation.

The microbes are similar to those usually found in rotting wood, and have been under study for two years.

Dr. Leonard notes that a low concentration of contaminants in the 1,000-gal.-an-hour appetites of jet aircraft can cause a troublesome amount of residue.

•

A sulfur-recovery plant will be built and operated in Texas by Trans-Jeff Chemical Co., a new firm owned jointly by Transcontinental Gas Pipe Line and Jefferson Lake Sulphur.

The plant, which is to go on stream within six months, is to be constructed near Tilden, McMullen County, and will recover the sulfur from the waste acid stream at Transco's gas plant nearby. Headquarters of the company will be in Houston.

Studies are being made to determine the feasibility of other chemical products.

•

Texaco Inc., is returning to Houston as the locale for this year's annual stockholders' meeting, scheduled for Apr. 26. Annual meetings have been held in New York since 1927. Always before that, they were held in Houston. The company says the Houston meeting will give stockholders in that section of the country an opportunity to attend.

•

An independent union bested the Oil, Chemical & Atomic Workers Union for the third time at Bayway, N.J. In a runoff election held by the National Labor Relations Board, the Independent Petroleum Workers Union of N.J. defeated OCAW 699-647 at the Esso Standard refinery of Humble Oil & Refining Co.

Approximately 95% of the eligible personnel voted in the runoff, as well as in the previous election (PW—Mar.4'60,p22), in which no union got a majority. In the Feb. 25 election, OCAW led IPWU 597-533, with the Teamsters getting only 136 votes, and the Operating Engineers 47. OCAW's previous defeats were in 1954 and 1957.

•

A British maritime report indicates that 8% of the world's tanker fleet was idle on Mar. 1. The report lists 308 vessels aggregating 3.1-million gross tons.

The U.S. total is put at 35 idle tankers aggregating 381,809 tons, or 10% of the country's fleet. Liberia and Britain each reportedly had 65 idle tankers, representing 13% and 8%, respectively, of their fleets. Other totals include Norway, 35 idle tankers; Panama, 32; and Italy, 29.

FPC's Hussey Dies

A heart attack felled Federal Power Commissioner John B. Hussey, 52, last week, as he prepared to address an American Petroleum Institute meeting in San Antonio. He collapsed and died as he was being introduced.

Hussey was regarded as a conservative, and had supported many producer views on natural gas legislation, including proposals to free the industry of utility-type controls. A Democrat, he was a former Conservation Commissioner in Louisiana.

He was nominated to FPC by President Eisenhower, and began a five-year term on June 23, 1958.

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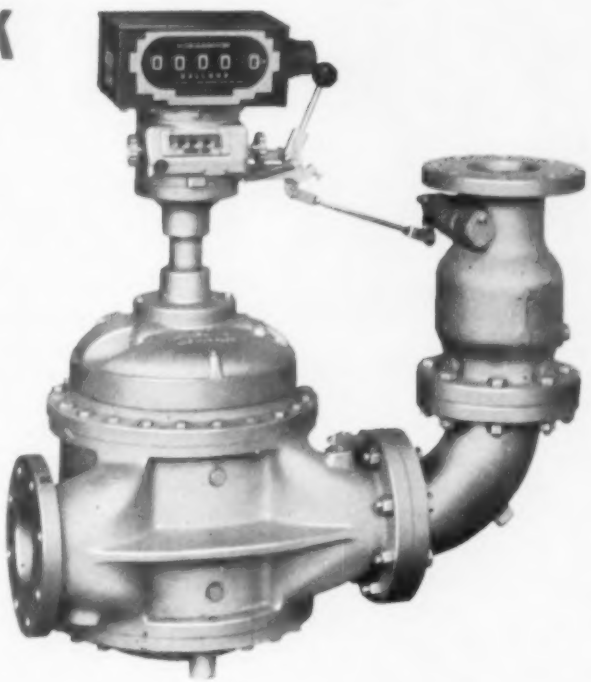

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Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
March 25, 1960

Make-up of the Federal Power Commission is in a state of flux, with one immediate vacancy and another commissioner's term expiring. President Eisenhower is expected to reach into the nation's gas-producing sector to nominate a successor to the late John B. Hussey of Louisiana (page 18). Almost traditionally, one of the five FPC members is named from the producing country. Hussey was Louisiana Commissioner of Conservation when he was appointed to FPC in 1958. His predecessor, Seaborn L. Digby, had held the same state position in Louisiana. One of President Truman's appointees was Harry Wimberley, a state Democratic Party leader in Oklahoma.

•

The present vacancy is not expected to be filled by a Texan—although that largest gas-producing state has not been represented on FPC. The White House can be expected to choose someone from Oklahoma, Louisiana, or perhaps New Mexico. Political observers claim that Texas representation would invite heavy criticism of the commission's membership. Also, there is some doubt that Senate Majority Leader Lyndon Johnson (D., Tex.), an unannounced candidate for the Democratic presidential nomination, would like to see a Texan named to FPC in this election year. President Eisenhower probably will name a Democrat to the commission, however; the law says that no more than three members of one political party can be commissioners at one time. Chairman Jerome Kuykendall and Commissioners Arthur Kline and Frederick Stueck are listed as Republicans, and Commissioner William Connole as an independent.

•

Commissioner Connole's term on FPC is scheduled to expire in three months. Connole, from Connecticut, was the youngest member ever to serve on a federal regulatory agency when he was appointed by Eisenhower in 1955. His five-year term will end June 22.

Connole is in line for reappointment, but the White House reportedly has received protests. Connole has been a target of criticism from gas industry officials, who look upon him as a spokesman for "consumer interests" and a proponent of stringent regulation. Friends of the commissioner dismiss reports about protests against his reappointment, however; they say Eisenhower must back up his original decision to name Connole with another five-year term, or face political embarrassment. Also, they question whether Vice-President Nixon, obviously the Republican nominee for President this fall, would want to inherit a furor which might be raised during the campaign if Connole were not again named.

•

Several natural gas pipeline companies are showing interest in a proposed government-industry helium program. The program, which the Interior Dept. is trying to push through Congress, calls for construction of 12 helium-extraction plants along gas pipelines, either by private industry or by the government. Under the bill, the U.S. would enter into long-term contracts to buy the helium. A revised version of the program, sponsored by Rep. Walter Rogers (D., Tex.), is expected to have the best chance of passage. At least three pipeline companies—Panhandle, Northern Natural, and Natural Gas Pipeline of America—have indicated they might be interested in building extraction plants.

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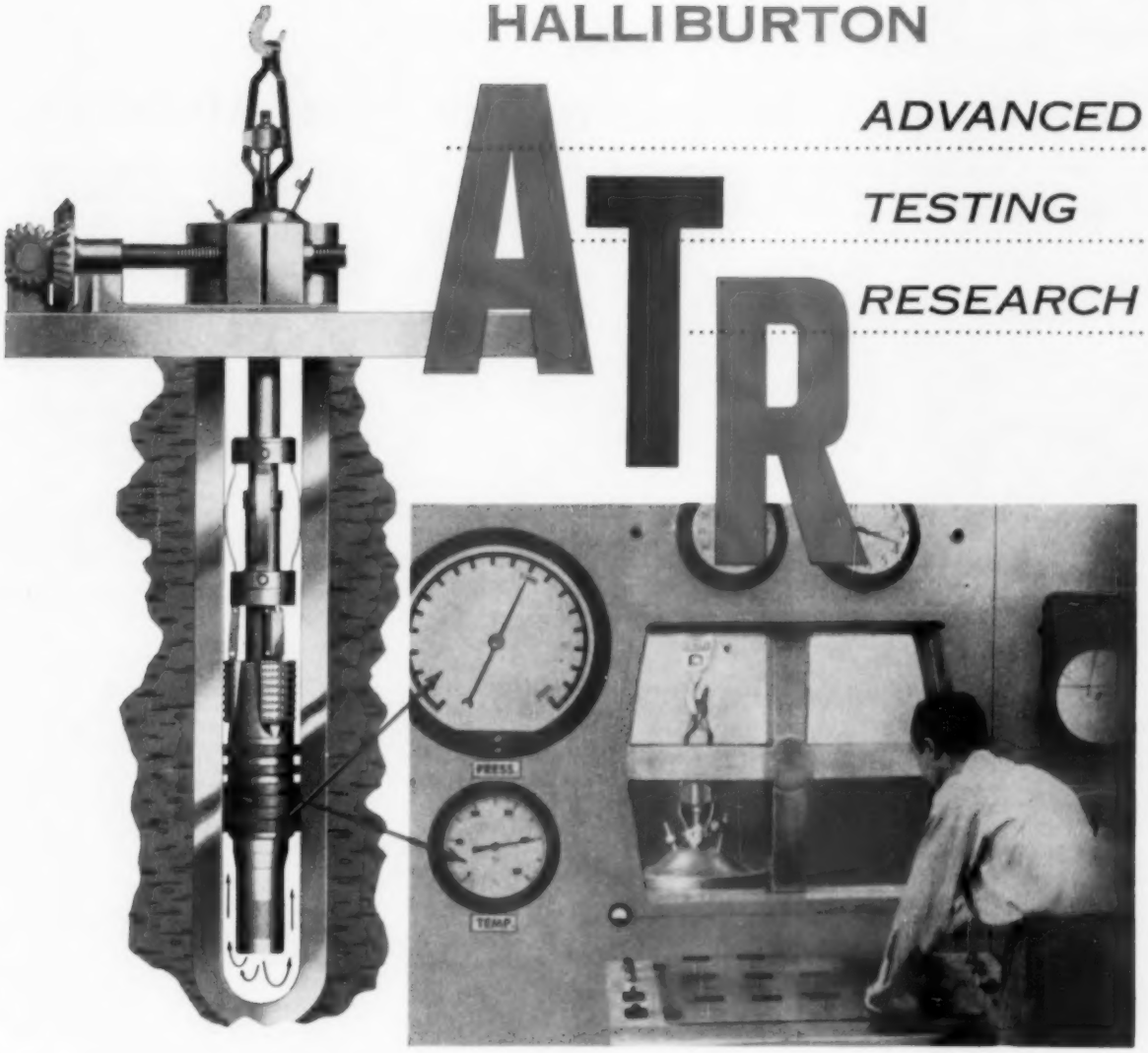

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Model May Help Sinclair Find More Oil

Studies of how formation waters affect the movement and collection of oil and gas may enable Sinclair Research Laboratories, Inc., to predict the producibility of a given reservoir.

"Our objective," says J. F. Johnson, director of Sinclair's exploration research division, "has been to develop criteria for determining the dynamic interactions of oil, gas, and water in order to predict the ability of a given formation to yield commercial amounts of oil.

"Our studies are mostly modifications and developments after the theory introduced by Petroleum Research Corp. and M. K. Hubbert."

Johnson points out that promising geologic structures often are not commercial because once-present oil has been dislodged by moving formation waters.

On the other hand, he says, small or insignificant structures may contain sizable hydrocarbon accumulations because of favorable hydrodynamic conditions.

The company's principal laboratory tools for hydrodynamic research are three-dimensional electric analog models of sedimentary basins (picture).

In the model, which is housed in a patented vacuum frame, the flow of artesian water through reservoir rocks is simulated by the flow of electric current through conductive paper.

Each model represents the conventional concept of an artesian basin, wherein permeable rocks outcrop at higher elevations on one or both sides of the basin.

This concept further assumes the permeability of the reservoir rock across the entire width of the basin, allowing water to flow in the higher outcrops and out the lower ones. This produces an artesian current through the aquifer (water-bearing) beds.

The average hydraulic gradient of each aquifer is obtained by dividing the difference in elevation of the two outcrops by the distance between.

For modeling purposes, the ability of the aquifer to transmit water is computed by multiplying the thickness of the aquifer beds by their permeability. Transmissibility is Sinclair's term for this relationship.

There are many ways in which the information from the analog model can be applied to finding oil.

ANALOG MODEL of a sedimentary basin is used by Sinclair to plot potentiometric maps to show detailed hydrodynamic pressure gradients of the horizons in the area.

"Consider a truncated reservoir," for example, says Johnson, "in which the overlying strata are not completely impermeable. If an artesian drive of sufficient force flows downdip through the overlying strata, there is a strong possibility it will offset the natural buoyancy of the oil and entrap it.

"If, on the other hand, the artesian drive is updip, the oil probably will have migrated from the truncated reservoir."

Similar thinking may be applied to a sand lens in which oil entrapment is created through facies change.

Hydraulic pressure updip in the reservoir would serve to depreciate the lithologic barrier appreciably, while downdip pressure would enhance it.

One of Sinclair's main objectives is to determine how steep an anticlinal structure must be in order to preserve an oil accumulation with a given hydraulic pressure.

In this study, the scientists are considering the possibility that an artesian current passing through a reservoir below the oil-water contact eventually will tilt it in the direction of the flow.

Equilibrium would be reached only when the buoyancy of the oil was balanced by the hydraulic pressure. Sinclair believes this may account in some instances for oil being removed from its normal crestal position in the structure.

Another possibility suggested by the tilted oil-water contact theory is that of the unclosed reservoir.

Production, for example, might be found on the anticlinal nose where there was a flattening of the plunge, provided the dip along the axis was less than the dip of the oil-water contact.

The company also is studying the effect of salinity variations on hydrodynamic calculations.

In the Rocky Mountain region, for example, waters associated with oil pools generally are much less salty than sea water. This fact prompts Sinclair to believe that many of the reservoirs have been flushed by artesian circulation.

On the other hand, oil accumulation in many other regions is associated with waters that are much saltier than sea water.

In these regions, it's considered probable that artesian circulation is unfavorable for oil and gas accumulation.

Sinclair believes that its analog approach to the study of reservoir hydrodynamics may overcome some of the objections to previous laboratory methods employing scale models.

Two field conditions which heretofore haven't been reproduced satisfactorily in the laboratory are time and size.

Processes and movements so slow they can barely be observed in the laboratory may be very important when given millions of years to operate in large basins. Also, grain size and permeability are difficult to reproduce in scale-model geologic basins.

Other field conditions that haven't been duplicated previously are the hydraulic gradient and the velocity of artesian currents. Sinclair has convert-

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ed all of these factors to terms of electrical resistivity.

Basic data used in compiling the analog model must, of course, be derived from conventional field sources.

Permeability of the formations is established through core analysis and extrapolation of drillstem test information. Cores also are used to establish grain size and pore volume.

Other necessary field data include the elevations of outcrops and their approximate locations, topography and drainage systems, and generalized structure and isopachus maps of the area.

Each basin model is constructed of superimposed sheets of electrically conductive paper, with each sheet representing a different horizon in the stratigraphic column.

The conductive paper is regular antistatic paper, such as is used in wrapping photographic film. But for Sinclair's purpose, it is calibrated in many different grades of resistivity.

Various fluid flows through formations are simulated by varying the resistivity of the paper in direct relation to the individual formation's thickness and permeability.

Structure is simulated by superimposing sheets in accordance with outlines indicated by structure maps.

The areal extent of a reservoir rock is simulated by cutting the sheets to represent paleo-areal interpretations.

The basin model is completed by placing successive sheets of paper on top of each other until the entire sedimentary section is formed.

When compilation of the section is complete, slits are cut through successive layers of the paper to simulate fault zones that effectively impede the movement of ground water.

Similarly, holes are cut in the model to represent relatively impervious areas.

Electric wires attached at each point where a reservoir rock outcrops simulate points where water may enter the reservoir.

Generally, the most important outcrops will be major drainage crossings, since most other outcrops (as along eroded ridges) are of doubtful significance in introducing meteoric water.

The amount of voltage is controlled through a "charging panel" containing 480 voltage dividers, which are manipulated to provide the correctly calibrated current.

The first step in gaining information from the model is to introduce current simultaneously to each simulated reservoir rock at all outcrop points.

A partial vacuum is then pulled with the vacuum pump, locking the model layers together tightly and assuring accurate instrument readings.

Insulated wires provided with electrodes, which have been sandwiched between the sheets of conductive paper, are pulled through the model.

An automatic voltage meter (potentiometer) records voltage at points in the formation where the electrode is stopped momentarily. Each of the voltage measurements is recorded, and its location in respect to surface control is noted on a base map.

In applying the information gained from the model, Sinclair researchers first make a potentiometric map from the voltage readings.

This is accomplished by drawing contour lines through points of approximately equal value, much as the geophysicist contours a phantom horizon from plotted seismic values.

Based on the potentiometric map, a single-sheet analog model representing one horizon is made up to show detailed hydrodynamic pressure gradients in a specific area which includes a likely structure or indicated stratigraphic trap.

The amount and direction of hydraulic drive on the oil body is then computed, and the single-sheet analog overlaid with a structure map.

The potentiometric drop (hydrodynamic gradient) is convertd to tilt surface (oil-water contact) by applying a tilt factor which takes into account the natural buoyancy of hydrocarbons.

The end result is a series of contour lines transposed on the structure map which represent the possible limits of oil accumulation.

Slim Hole Triply Completed

Christie, Mitchell & Mitchell this week completed a North Texas triple producer within 4½-in. casing.

George Mitchell, president of the Houston firm, said the company's No. 6 Tarrant County Water Board, Levi Howard survey, Wise County, was completed for oil from two zones and for gas from the third. Completion efforts were delayed for nearly a month because of bad weather.

The completion is believed to be the first triple within 4½-in. casing. Mitchell says the well was completed as planned (PW—Feb.12'60,p21).

Some difficulties, however, were encountered during completion, in which oil is produced through two tubing strings and gas through the annulus.

E. F. Frnka, district superintendent, says one difficulty arose because the two strings of tubing used were of different lengths. "The upset string was 33 ft. long and the nonupset string was only 31 ft. long," Frnka explains. "We therefore had to add 6-ft. subs on every third joint of nonupset tubing in order to keep the lengths equal."

Another problem was maintenance of tension on the tubing strings as they were lowered simultaneously. Had one of the strings not been under tension, Frnka said, the tubing might have "curled or bent" over to one side of the casing.

In order to solve this problem, CM&M rigged up dual slips. These slips were attached to both strings so that they could be lowered simultaneously. The poles of the workover rig used were raised to the limit to allow the concurrent lowering. The substructure also was raised 7 to 8 ft. so that necessary blowout preventers could be installed and to allow the company to "distort" (spread apart) the pipe so that bowls and slips could be set.

The completion itself took only 24 hours. CM&M believes that similar completions in the future can be completed in 16 hours.

Frnka notes that it took nearly two weeks to assemble the equipment and tools needed for the special completion—but that after that the job went quickly. The experience gained on the job, he added, will enable even speedier completions in future operations.

"Another worry we had prior to the completion," says Frnka, "was possible points of failure. All of the packers, however, are holding up, and there are no signs of leaks."

Morris Thompson, production manager, adds that "the job was very successful as far as economics are concerned."

The two oil zones flowed a total of about 350 b/d on test and the gas zone gauged 5.5-million cf/d.

The upper oil zone tested 102 b/d through 12/64-in. choke and perforations at 4,714½-26½ ft.

The middle zone tested 5.5-million cf/d of gas on open flow from perforations at 5,441-53 ft.; through 12/64-in. choke it flowed 882,000 cf/d.

The lower zone flowed at the rate of 10 bbl. of oil per hour through 1¼-in. choke and perforations at 5,656-81 ft., after swabbing.

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The easy handling of Peladow further reduces high rig and handling costs in offshore and tideland operations. On the spot, the pellets dissolve quickly in one step in a mud pit or tank, and the resulting brine can be handled with standard mud pumps.

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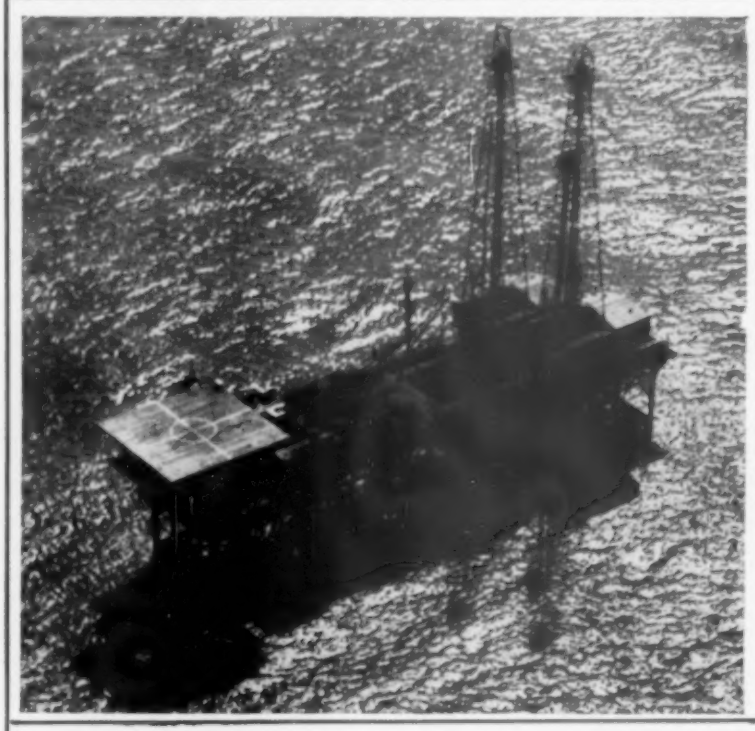

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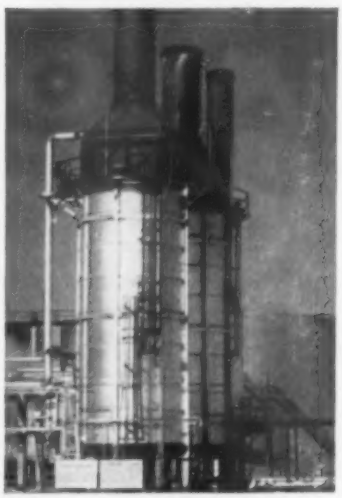

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Foothills Get Special Control Survey

A special type of control survey for Alberta's vast foothills region is reducing survey costs and simplifying location of wildcats.

Not only does the new method of surveying cut costs, but the accuracy promised by the system in the wild and woolly region should enable operators to hit "target areas" more easily.

The foothills region encompasses about 30,000 sq. mi. The special system has been applied so far to the Eastern Rockies Forest Conservation Area, where enough "control" has been established to cover 44 townships between the 9th and 11th base lines, east of the Big Horn range—an area of about 1,600 sq. mi.

By contributing to more accurate placement of wildcats, the special survey system will reduce chances of penalties if a wildcat is not completed within the "target area."

Under Alberta regulations, penalties are invoked if the well is completed outside the target area. For oil wells, this is generally the center of a legal subdivision (40 acres). When topography or geology makes such placement unsuitable, a test can be offset within a square with sides of 330 ft.—the "ground target area." During drilling, a deviation from this initial area is allowed, whereby the side of the square can be increased, in relation to depth, to a maximum of 660 ft. at the producing horizon.

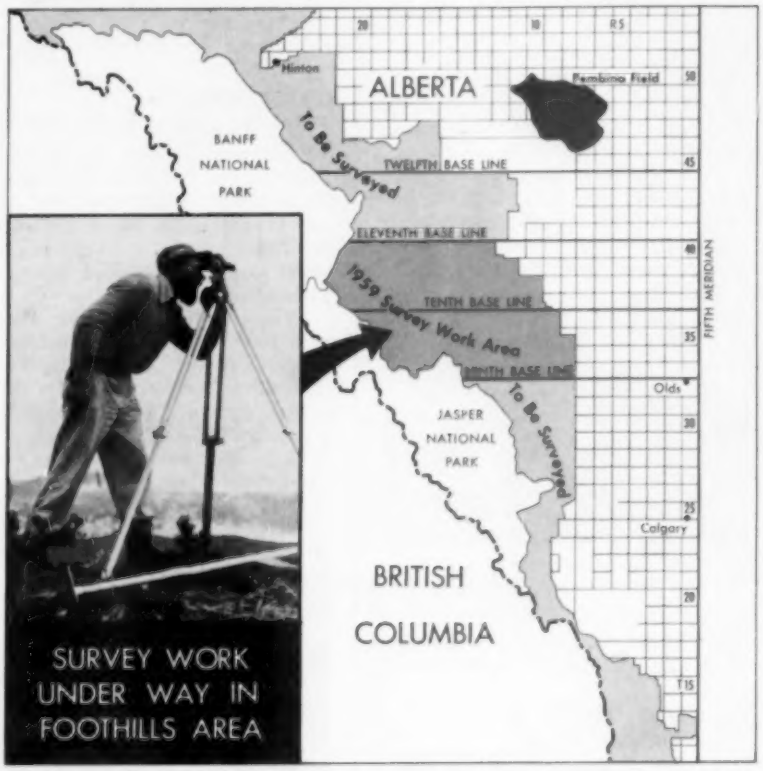
The target area for gas wells is greater than for oil wells, but similar penalties can be imposed.

In some cases, penalties have amounted to outright cancellation of production. This can be particularly damaging in areas where holes cost upward of a half-million dollars. And in the foothills belt, such costs can top $1-million.

Some changes in the stringent regulations are expected soon, however. The technical committee of the Canadian Petroleum Assn.'s Alberta Division reported at its recent annual meeting that a submission had been presented to the Alberta Oil & Gas Conservation Board to ease the rules in areas where surface or subsurface conditions make hitting the target area particularly difficult.

The same type of request has been made in British Columbia. Favorable action is expected in both provinces.

The Alberta submission does not ask for removal of target-area restrictions. Rather, it asks for changes in application, so that more leeway is allowed in areas where ownership of land is held by the same working interests and royalty owners.



INITIAL FOOTHILLS SURVEY was concentrated in some 1,600 sq. mi. between the 9th and 11th base lines because of increasing exploration in the rugged area.

Key to the unique survey system, termed the "Foothills Control Project," is the use of a Tellurometer in surveys for township positions, and establishment of stations at such vantage points as hill tops.

The project was undertaken last summer in the foothills area because normal projection of base lines and central meridians is often impractical.

Some type of geodetic process with a station density of about one per township was indicated. The problem was tackled by CPA's Survey Committee, Alberta Division.

J. W. Hill, of Triad Oil Co., Ltd., who is chairman of the committee, notes that, without a special survey system, lines would have to be cut in a definite direction under most difficult conditions.

"If a mountain came in the way," he explained, "you'd have to slug over it. Much cutting would have to be done by hand because a 'Cat' couldn't stand on the slopes, which run 36 to 37 degrees from horizontal."

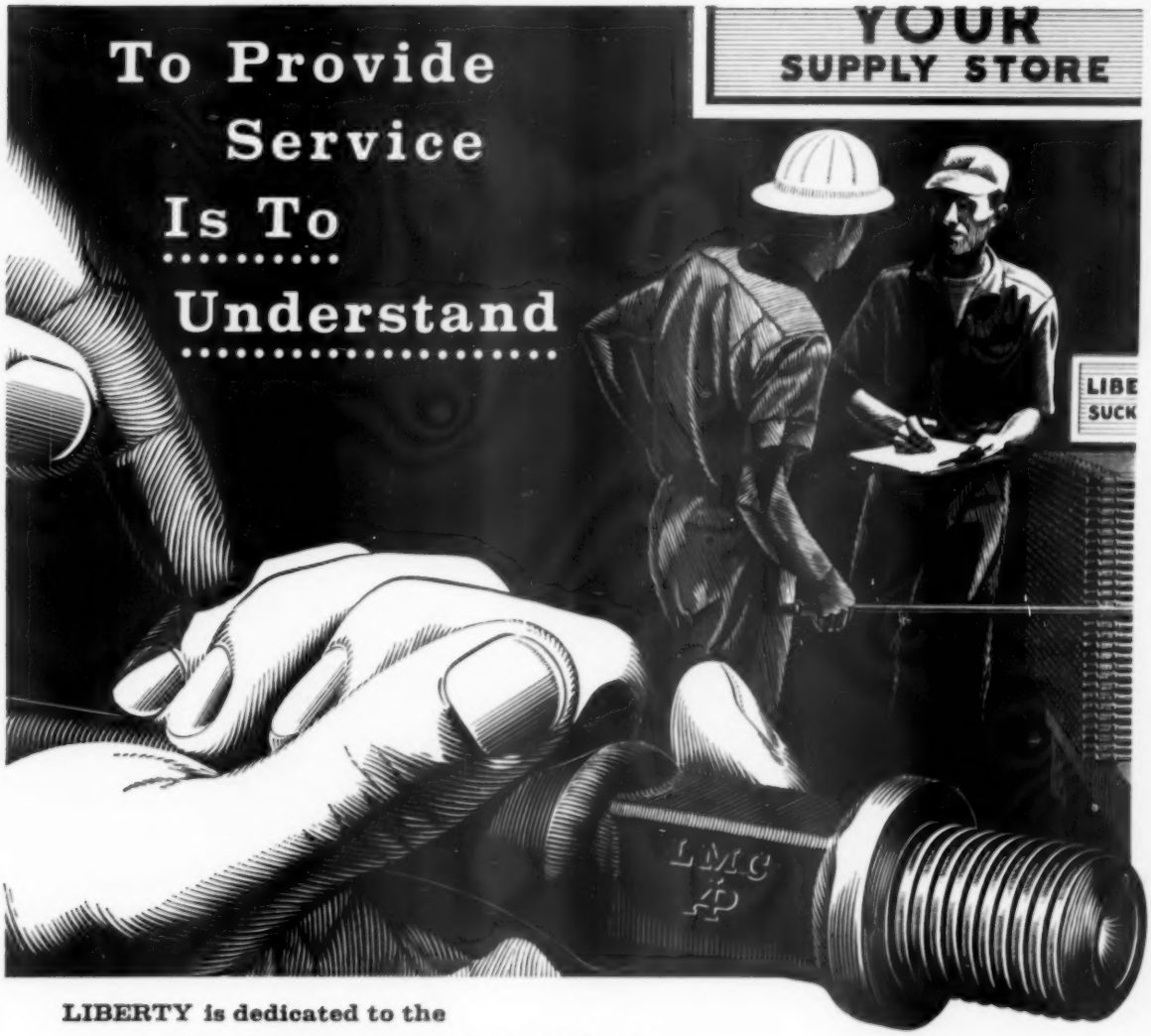
The Tellurometer is a portable instrument that measures distances electronically. It has been used in Middle East exploration, and elsewhere, but the foothills project marks its first use for surveying township positions in Canada.

Companies operating in the foothills belt and in other unsurveyed areas of the province have been making time-consuming, conventional surveys by traverse methods.

Many of these traverses are made along existing trails, with errors a constant threat. Such traverses sometimes have to be carried many miles—perhaps 30 mi. or more—by way of old trails and seismic cut lines, up and down steep inclines.

With the new system, Hill told PETROLEUM WEEK, "the main framework has been fixed by a traverse of geodetic accuracy where distance measurements have been made by utilizing the Tellurometer and where angles have been observed with a theodolite (angle-measuring instrument) reading to one second of arc."

Cost of the initial special survey, on a per-mile basis, was considerably below conventional methods. The av-



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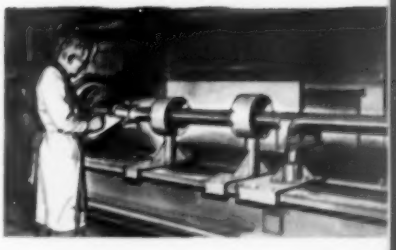

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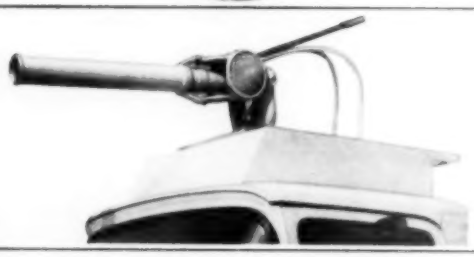
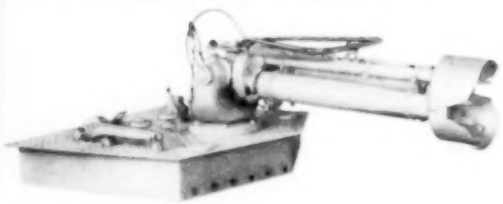
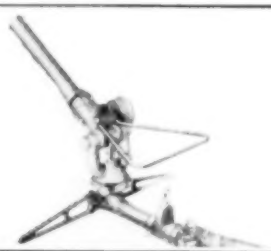


Remote Manual Control Type — Easily handled by man in driver's seat. Ideal for fast action!



Remote Hydraulic Control Type — Power-controlled from within the cab. Single and dual models. Widely used on air crash rescue fire-fighting trucks.



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TRAVERSE STATION is established beside a Dominion horizontal control point, where the elevation is 8,050 ft.

TELLUROMETER (left), target, and theodolite, key instruments in the special survey, are set on a cleared station.

erage normal survey cost per mile in such terrain has been estimated at roughly $500. "But," says Hill, "it can run up to $1,000 per mile. No one knows."

Cost of the initial foothills project was about $75,000, or about $280 per mile.

C. W. Youngs, Alberta's Assistant Director of Surveys, says:

"It is difficult to make a comparison of costs between this special survey and the normal type of survey.

"However, basing the whole cost of the operation on 44 townships, at 6 mi. per township, the cost per mile is slightly more than half the cost per mile for normal base-line surveys in rolling, tree-covered terrain.

"This cost per mile will be considerably reduced if the operation is expanded in the same general area, as the main traverse is established and needs only be expanded to tie in base-line monuments.

"In addition, the weather this past summer was particularly bad, even for the foothills region. Heavy winds or low clouds made flying impossible and instrument work unreliable."

The special survey has proved highly accurate.

At the recent meeting of CPA's Alberta Division, Hill reported:

"The recent provincial control has been conducted to a high order of accuracy. In fact, it is safe to say that in the worst possible terrain we have the best possible surveys.

"If methods of minor triangulation are utilized in the field, it is conceivable that well sites in very remote regions can be coordinated, both for position and elevation, in a reasonably short period of time to a high degree of accuracy.

"Apart from the immediate application to the locating of well sites, the control traverse stations will be indispensable to the mapmakers."

The Foothills Control Project was carried out last summer with a crew of nine, which used a four-wheel-drive truck and a helicopter.

Hill, in his report, said:

"A main control traverse with a high degree of accuracy was carried by the Tellurometer from a geodetic triangulation station near Olds to another station near Hinton, a distance of 186 mi.

"From this traverse, secondary lines were run with connections to base-line monuments. Elevations by vertical-angulation have been obtained for each station (51 stations were built on the secondary loops).

"While the accuracy of such elevations is not so high as that obtained by normal leveling, it will nevertheless be quite adequate for work in such regions.

"The Surveys Branch intends to issue a diagram showing all stations that have been established, listing geographical values. We feel that this type of information will be convenient to use in field survey operations.

"It is proposed, therefore, to suggest to the Director of Surveys that a local rectangular grid system be set up, so that all station and base-line monuments, existing and projected may be alloted appropriate coordinate values. Lists giving grid positions and grid bearings should be issued for use in this area. Surveys could then be conducted by normal methods, using plane trigonometry."

Stations were defined by a statutory pipe post driven to within 4 in. of its top, over which a permanent target was erected.

The stations were chosen so that they are visible from many points along the forestry road, and from accessible points off the main road.

When three stations are visible, it is only a matter of reading the angles to them from the selected instrument station and then calculating the position of the instrument by geographic coordinates.

Having the geographic position of the instrument, it is then necessary to convert it into position in terms of the Land Survey System, or, conversely, to compute the geographic coordinates for the center of the legal subdivision.

The Alberta government will issue regulations to standardize the method of surveys for oil-well locations in unsurveyed territory. A system of registration of oil-company surveys in such unsubdivided lands also has been adopted.

The registration system provides savings in that any registered survey becomes available through the office of the Director of Surveys in Edmonton, thus eliminating duplication of surveys.

The standardization of regulations could avert costly losses by reducing the chance of errors.

Hill has said that, "as things stand now, many independent surveys are made in the same locality, resulting in needless duplication. This also increases the time, expense, and possibility of error for any particular job."

Adoption of the special approach could lead to a complete survey of the foothills in three or four years, only about one-fifth as long as usual methods would require.

The survey of the foothills undoubtedly will continue, but application for extension must be made each year to the Dept. of Mines & Minerals.

The area first selected for control was requested by operators, since it was one of the most active.

Pittsburgh Seamless Helps Texas Driller Solve Cost Squeeze In Grapefruit Grove

Texkan Oil Company Has 'Never Run Into Defects With Pittsburgh Casing,' Relies on Independent Distributor for Fast, Reliable Service

Any time you go probing for gas where grapefruit grow, tree damage and higher leasing costs put an extra "squeeze" on drilling budgets.

Authority for this is a fast-moving Dallas independent, Richard M. (Dick) Finder. He owns and heads Texkan Oil Company, a medium-sized producer now drilling in the promising Whitted Field surrounding McAllen, Texas.

Located in the middle of the Lower Rio Grande Valley (in Hidalgo County) the McAllen area is well-irrigated. Thus, its nearly 50,000 trees grow great quantities of the famous Texas pink grapefruit.

Underneath the neat rows of trees, however, are natural gas pools large enough to have made the area well-known among oilmen for the size of its reserves.

But since you can't get to the gas till you've gone through the grapefruit, you have to find a way to offset the $18 to $25 it costs to buy a matured tree.

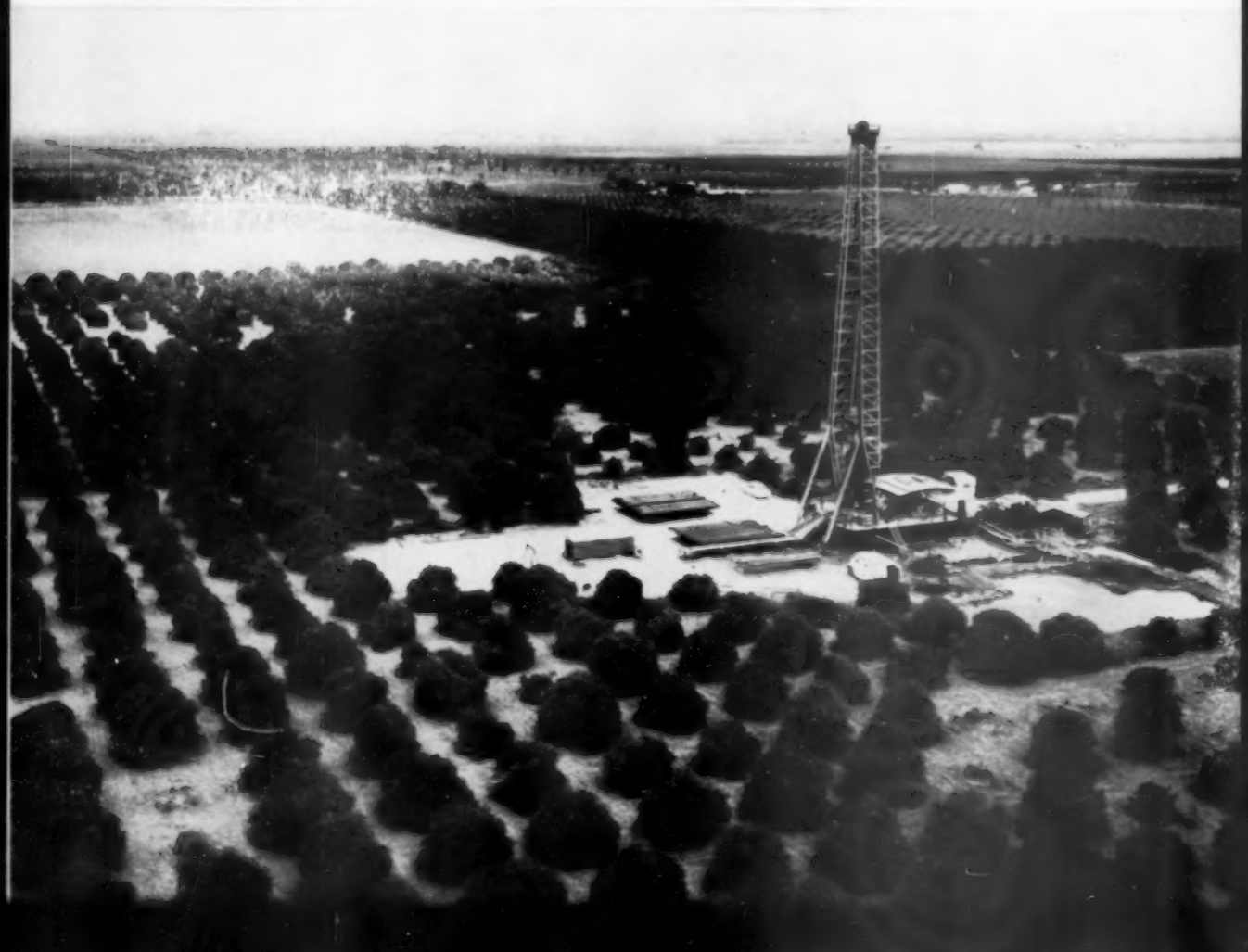
• **Three ways**—Texkan follows three rules to reduce as much as possible the financial risks of exploration and drilling:

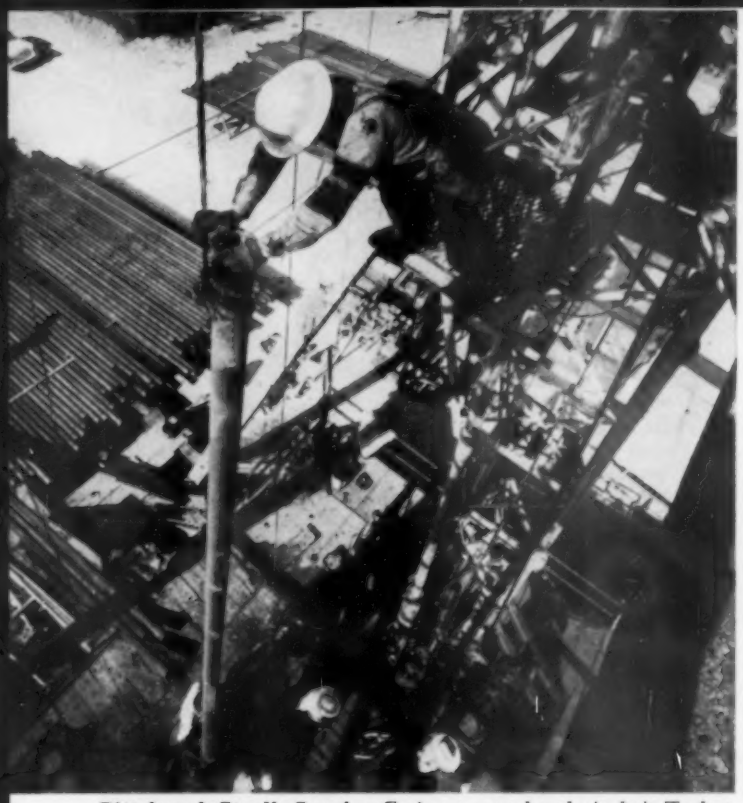
• **Texkan uses the latest scientific testing equipment** and procedures whether there's a grapefruit grove involved or not.

• **Texkan buys from independent oil field supply companies,** suppliers who have built their businesses by offering top quality in materials and service. Texkan knows these independents stand behind their sales.

• **Texkan insists on API quality** in the seamless steel products it uses, such as drill pipe, tubing and casing made by Pittsburgh Steel Company, one of the nation's most experienced seamless producers.

Near McAllen, Texas, in the lower Rio Grande Valley, this 129-foot drilling rig stands out in a landscape of a grapefruit grove. The area is a major producer of Texas pink grapefruit. Gas drillers must add tree damage costs to the usual heavy drilling expenses. Mature grapefruit trees are worth from $18 to $25 each.





Pittsburgh Steel's Seamless Casing was used exclusively in Texkan Oil Company's 7,500-foot well in Hidalgo County, Tex. Here, roughneck positions casing from monkeyboard on 129-foot rig.

Thread protectors must come off before casing goes to drilling platform. Texkan says it has never had defects in Pittsburgh Seamless.

Independent supplier's overnight delivery of casing kept well fully on schedule—vital if drilling costs are to be controlled.

Mr. Finder reasons that the price structure for natural gas leaves little margin to go on. So, he's got to keep drilling and exploration costs at rock-bottom.

As to choice of suppliers, Texkan's size dictates that it must have a flexible and immediate source of steel products. In times of shortages, Texkan has gotten help from the independent suppliers who know they must serve to compete.

On seamless quality, Texkan's Chief Engineer—M.D. Frazier—puts it this way:

"There's no reason for drilling, if you don't have performance from pipe. If you don't have good pipe, you have no well. We've never run into defects with Pittsburgh Steel's Seamless. Casing threads and pitch all check out and Pittsburgh Seamless is this way with consistency."

Thus, when Texkan ran 7,500 feet of casing into its eighth well in the Whitted Field, it was assured pipe to meet the area's unusually high pressure, and the knowledge that it was made by a steel producer and sold by an independent supplier who know their business because they know the oil business.

Texkan owner Richard M. Finder (left) likes the personal service he gets from independent supplier's representative, Paul Evershade.

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Lucey Export Corporation
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Lucey Products Corporation
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McJunkin Corporation
Charleston 22, West Virginia

Midland Supply Company
Wichita 7, Kansas

Mountain Iron & Supply Co.
Wichita 2, Kansas

The Producers Supply & Tool Co.
Fort Worth 2, Texas

Production & Refining Equipment Company
Odessa, Texas

Sandy Supply Company
Wooster, Ohio

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The Straker Supply Company
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What's New / IN EXPLORATION, DRILLING, PRODUCTION

Final statements were given this week at a Texas Railroad Commission hearing on the proposed Aldwell unit in the Spraberry area, Reagan County, West Texas.

Southland Royalty Co. and others have applied for a cooperative 15,776-acre waterflood project that will boost ultimate oil recovery by an estimated 19-million bbl.

The $3-million project is the first unitized waterflood proposed for the giant 340,000-acre Spraberry Trend. All 55 operators in the unit area, and 288 of 307 royalty owners, have signed the unit agreement.

•

An organic additive to control fluid loss in cement slurries has been tested successfully in squeeze operations.

C. M. Stout and W. W. Wahl, both with Dowell Division of Dow Chemical Co., reported last week that the additive, designated D23, probably can also be used in either neat cement or cements modified with bentonite to obtain low water-loss cements for cementing casing.

They described D23 as a high-molecular-weight, synthetic polymer that is compatible with bentonitic materials and all portland cements. They added that D23, which has been used in the five field tests so far, does not retard cement-setting times, nor adversely affect physical characteristics of the set cement.

Stout and Wahl added that D23 is effective over a wide range of well conditions and should provide improved control of cementing operations. The two reported on the additive at the Upper Gulf Coast Drilling & Production Conference, Beaumont, Tex., sponsored by the Spindletop Section, Society of Petroleum Engineers, AIME.

•

Saskatchewan Power Corp. is paying $25-million to acquire Many Island Lake gas field in Alberta.

The power company, a crown corporation owned and operated by the province of Saskatchewan, is paying $15.2-million to Crescent Petroleum Corp. for its undivided one-half interest, and $10-million to Britalta Petroleums Ltd. for its half interest.

A total of $1,520,000 in cash was paid to Crescent, with the balance to be paid in 18 annual installments. Britalta received $1-million in cash, with the balance in long-term 5¼% bonds. In Britalta's case, entire proceeds of the sale are tax-exempt.

The field covers 152,000 acres and contains an estimated 800-billion cu. ft. of gas reserves.

•

Sunray Mid-Continent Oil Co. has consolidated its West Coast and Rocky Mountain exploration and production divisions into a new Western Division headquartered in Denver.

Paul E. Taliaferro, president, said the consolidation "is a natural move in the streamlining of company operations, which has been in progress for the past year." John H. Douma, vice-president and general manager of the West Coast Division, will head the new division, in the same capacity.

•

A Kansas judge has upheld the Kansas Corporation Commission allowables for current production periods in the latest round of the battle between the commission and Hugoton gas field operators.

Judge L. L. Morgan of the Stevens County District Court, upheld the commission last week in the first of two suits testing a 1959 law, which became effective last July 1.

In the cases, the Southwest Kansas Royalty Owners Assn. and Panhandle Eastern Pipeline Co. filed separate petitions, contending that allowables were too low.

In another series of actions pending in another court, four firms are involved in separate actions against the commission. In those suits, however, the firms allege that allowables are set too high.

•

The Navy has decided to retain its Long Beach (Calif.) shipyard and will help fight the subsidence threatening the area.

The Navy is reported satisfied with progress of efforts to halt the subsidence at Wilmington field, and will seek an additional $5-million to use in the fight (PW—Nov.27'59,p19).

•

Two new directories and a geological report are available to oilmen.

The National Petroleum Bibliography, Amarillo, Tex., has just issued

Truck-Mounted Rotary Rig Makes Debut

Either mud or air can be used as the circulating medium in drilling with this new truck-mounted rotary drill made by Bucyrus-Erie Co. It is designed for seismic and exploration operations, as well as for shallow drilling.

The standard mast will accommodate 15-ft. drillpipe, and 20-ft. pipe with a 5-ft. mast extension. A self-adjusting built-in breakout wrench will handle tool joints in sizes ranging from 3-in. OD to 4¼-in. OD. The rig is equipped with a single-stage, 485-cfm. compressor and a 5x6 mud pump.

Other features of the rig are split-type power takeoff with individual friction clutch drives for all main machiner, a double-drum drawworks, and a Beco-built spiral bevel gear rotary table with 4-speed forward and reverse drive. Maximum length of the rig with standard mast is 28 ft. 5 in. Over-all length with the larger mast is 32 ft. 10 in. Maximum width is 8 ft. and traveling height is about 11 ft.

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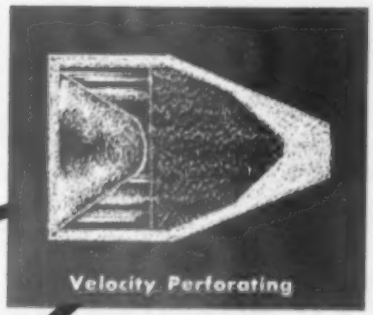

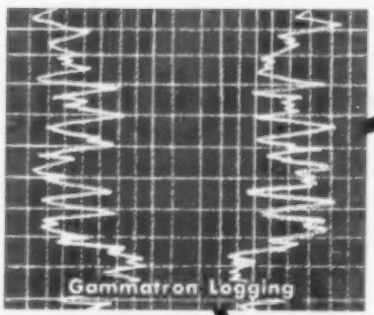

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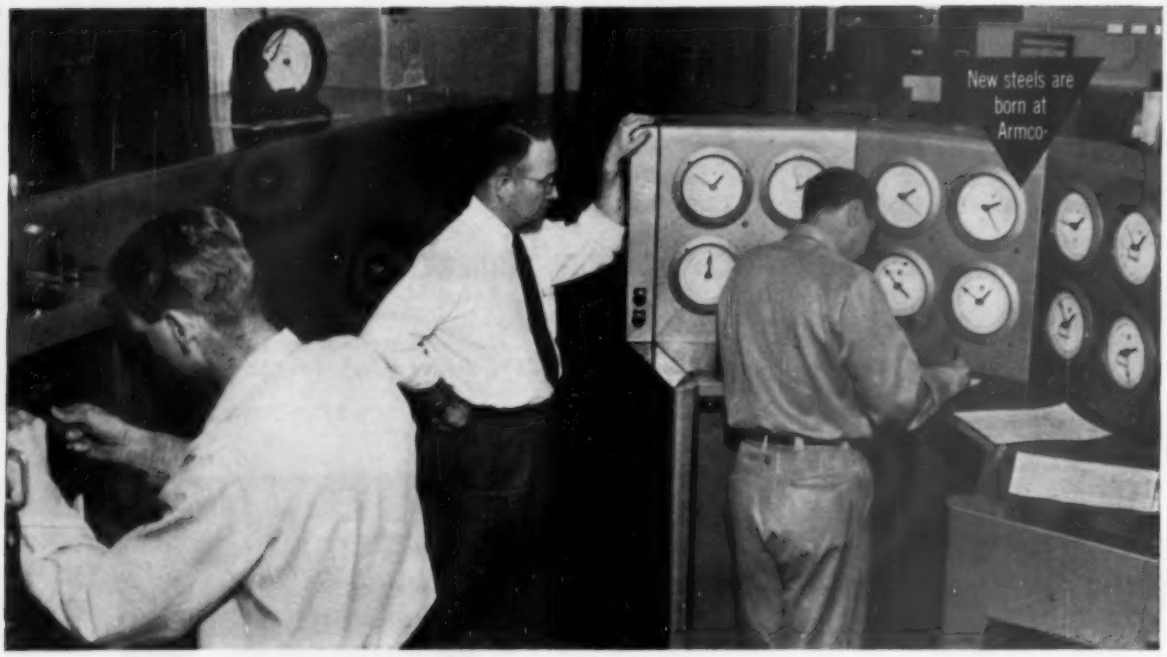

How Sheffield alloy steels "show their colors" in quality control tests

In 60 seconds the instrument shown above reports the exact percentages of alloying elements in a sample of steel. Does it by analyzing the color spectrum of the metal.

Called the Direct-Reading Spectrometer, this is one of many advanced testing instruments and techniques which assure precise quality control of Sheffield alloy and carbon steels.

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If you're a manufacturer using steel, you'll find in the Sheffield alloys the right metal for making better products at lower cost. Sheffield's continuing expanded steelmaking and heat-treating facilities — and nearby locations — give you buying advantages worth learning about. Get in touch with us at Houston, Texas.

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"Hugoton Embayment-Anadarko Basin Handbook," one of the largest reference books ever to deal with a single oil and gas province. The 500 page volume covers oil and gas activity through 1959 for over 60,000 sq. mi. in the area.

The Joint Petroleum Societies of Ft. Worth have published their 1960 directory, listing membership of the societies and top employees of oil firms in Ft. Worth.

The research report, issued as University Publication 6,005 by the University of Texas Bureau of Economic Geology, describes Marathon Basin fossils, called graptolites, which will aid oil exploration teams to correlate formations.

•

Engineering

A plastic sleeve to protect tubing from perforation blasts in multiple-completion oil and gas wells has been developed by Grigsby Bros., Inc., Lafayette, La.

The blast joint protector is fitted to the exterior walls of steel tubing, and is guaranteed against shifting, sliding, buckling, or bellying under pressure. The company claims the high-impact plastic increases tubing life expectancy by as much as eight times in deep-hole wells with blast problems.

•

A large-scale, high-speed electronic data-processing system has been introduced by Bendix Computer Division of Bendix Aviation Corp.

The system, which is called the G-20, is applicable to a wide range of oil industry uses, such as reservoir analysis, refinery control, and operations research.

The system is transistorized and is capable of 45,000 floating point operations per second.

•

Drilling Highlights

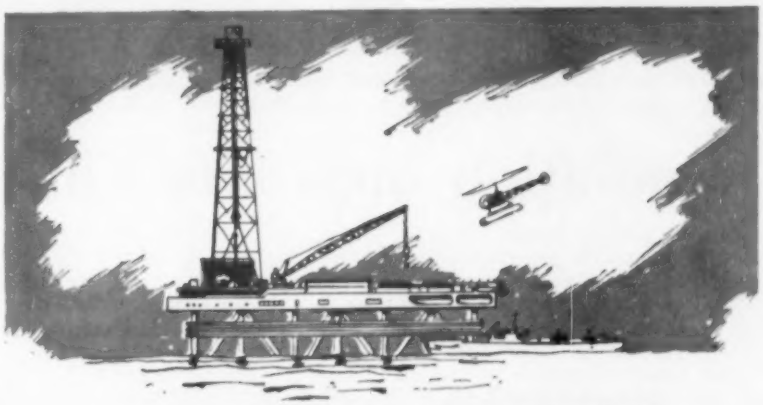
Montana—American Climax Petroleum and Lawrence Barker, Jr., No. 1 DeJaegher, section 31-11n-31e, Musselshell County, recovered 2,300 ft. of oil and 500 ft. of oil-cut mud on 2-hour drillstem test at 4,306-28 ft. in the Tyler A and Bear Gulch formations. The prospect is 2 mi. southwest of Ivanhoe field.

West Texas—Great Western Drilling Co. No. 1 Allen, section 41, block 37, T-1-N, T&P survey, Martin County, was dually completed on the pump for 186 b/d of 36-gravity oil through perforations at 8,260-300 ft. in the Spraberry, and for 184 b/d of 38-gravity oil through perforations at 8,550-600 ft. in the Wolfcamp. The well is 3½ mi. southeast of Glass field.

Oklahoma—Wilcox Oil Co. No. 1-A Duggins, section 8-9n-22w, Beckham County, flowed 22-million cf/d of gas plus 50 b/d of condensate through perforations at 8,581-89 ft. in the Upper Deese (Pennsylvanian). The wildcat is 1 mi. west of North Carter field.

Wyoming—Kewanee Oil Co. No. 1 Norman, section 14-48n-69w, Campbell County, recovered 35 bbl. of oil, 5½ bbl. of mud-cut oil, and 720 ft. of oil-cut mud on 1-hour drillstem test at 8,335-71 ft. in the Minnelusa (Pennsylvanian), 2 mi. south of Dakota production at Raven Creek field.

Alberta—Home Oil Co. No. 10-25 Westcott, lsd 10-25-31-3w5, 7 mi. west of Didsbury, flowed gas at the rate of 8-million cf/d through ½-in. choke on drillstem test at 8,109-63 ft. in the Elkton. The wildcat is 5 mi. northeast of Westcott oil field.



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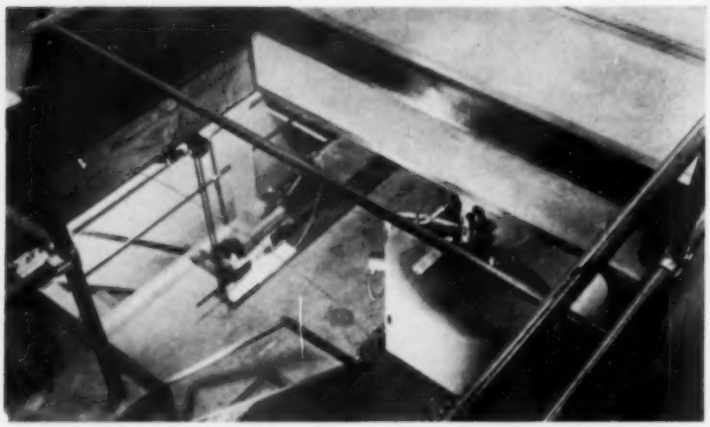

GE ELECTRON GENERATOR (foreground) bombards with 2-million-volt radiation a tape of polyethylene that unwinds (background) and passes underneath it, in a heavy-concrete-protected vault. A TV screen (right) monitors the process by which . . .

Irradiation Improves Film Structure

A much stronger, stretchable, completely transparent polyethylene film can now be produced by the application of radiation processing, says W. R. Grace & Co.

The principal use of the new film, which is called Cryovac L, is expected to be for the packaging of foods. But it lends itself to many other uses.

Grace has been making a plastic film—of polyvinylidene chloride—for packaging purposes for many years. This film was stretched in two dimensions in the course of its manufacture. During the packaging process, the film was heated, which caused it to shrink, and thus to hold the package as tightly as a "second skin."

Polyvinylidene, however, does not "breathe," a condition required for the packaging of many food items. Polyethylene and other polyolefin films breathe freely.

But when the company tried to apply the stretching process to a film of polyethylene, it discovered that it couldn't take it. Its linear molecular structure, with long, loosely branched chains, caused it to tear apart.

Irradiation of polyethylene film, by means of high-voltage electrons, modifies and strengthens its structure to the extent that it can be substantially stretched without tearing.

Polyethylene pellets are first extruded into a "tape" of medium width and thickness (picture). The tape is passed under a 2-million-volt General Electric electron-beam generator.

The effect of the electron bombardment, according to Grace, is first to break up the weak molecular links of the plastic, then to perform energetic new cross-linking. Thus, the tape acquires sufficient structural strength to stand, without breaking, a bi-axial stretching process.

This stretching process, which Grace considers the heart of its process, results in a film which can be printed, and cut to required commercial sizes.

When heat is applied to this irradiated, stretched, plastic film, it promptly shrinks it to less than one-half of its initial size, without losing any of its properties.

After a package is loosely wrapped in the film, it is passed through a heating tunnel, where, at a temperature of from 170F to 210F, the film shrinks instantly, and makes a tight, well-sealed wrapping.

Cryovac L is completely transparent, even when eight superimposed layers are used for packaging. It is very permeable to air and oxygen, resists acids and alkalis, and has a high tensile strength. It can be used at temperatures varying from —60F to above 200F—it softens at 220F.

The irradiation process does not make the film radioactive.

E. N. Funkhouser, executive vice-president of Grace's Cryovac division, says it would take four to five times the voltage that the GE machine is capable of producing to make the polyethylene radioactive. The film is completely inert when it leaves the generator; its molecules are simply "reoriented," Funkhouser says.

However, safety regulations more rigid than those prescribed by the Atomic Energy Commission protect the personnel of the plant.

The irradiation equipment is contained in a vault with 5-ft.-thick concrete walls, and the electronic components are kept in an atmosphere of inert gas under pressure. The irradiation operation is completely automatic; it is controlled from two instrument consoles, and can be observed on a TV monitor.

Cryovac's plant, at Simpsonville, S. C., has a capacity of several million pounds of irradiated polyethylene a year.

Cryovac has quietly been testing its new film on a commercial basis for the past two years. It is presently being produced at the rate of over 1-million lb. a year. But more electron beam generators—each costing $100,000—are being installed.

The irradiation process does not significantly increase the cost of the film, the company says.

Cryovac L today sells for 3¢ per 1,000 sq. in. of 1-mil film. This is well in line with other films for comparable uses.

Radiation has been used before on plastics—but only rarely, and never on plastic film.

Grace itself, in cooperation with Sequoia Wire & Cable Co., uses radiation to treat polyethylene that is used for wire and cable insulation, to make it more resistant. General Electric has a similar process.

Cryovac L is, at present made out of conventional low-density polyethylene. But high-density polyethylene, other polyolefins, and copolymers are also being considered for radiation treatment.

Oil Wins Time on Food-Additive Ruling

Refiners who are affected by the new federal "food additive amendment" have been granted a full extra year in which to comply.

The amendment to the Food, Drug, & Cosmetic Act became effective Mar. 6. It requires manufacturers of any material that is used in the preparation of food, drugs, or cosmetics, or that comes in contact with such products, to submit evidence that the material has no tendency to cause cancer.

In many cases, the needed evidence simply could not be assembled in time. Thus, many requests for extension were filed by manufacturers. This extra time has now been granted.

This amendment affects a great variety of petroleum and petrochemical products.

Among those are waxes, petrolatum, and white mineral oils, as well as plastic films, such as polyethylene, of petrochemical origin.

But it may actually go far beyond this restricted list: Some food processors who use compressed air, for example, have seriously questioned oil companies about the carcinogenic properties of the minute traces of lubricant that might be carried over with the air.

Expensive and time-consuming tests must be carried out to satisfy the requirements of the amendment.

For several years, the American Petroleum Institute has been conducting tests on the carcinogenicity—propensity to generate cancer—of waxes. That study was started in 1956, after Dr. W. C. Hueper, of the National Cancer Institute, at a meeting in Rome, said that certain mineral oils and paraffins used for coating milk cartons had produced cancer in man and experimental animals.

These tests are being conducted at the Chicago Medical School, under the direction of Dr. Philippe Shubik.

The test program is threefold. It studies simultaneously:

- Skin painting of mice with waxes;
- Subcutaneous implantation of wax in mice; and
- Addition of 10% of powdered wax to the food of rats.

As the tests must run over the entire life cycle of the animals—about two years—and as accidental sicknesses may occur in the control animals as much as, or even more than, in the animals under test, a long period is involved.

API has now asked the FDA to give a clear bill of health to Type I waxes—those of paraffin origin—and to grant a one-year extension to complete the tests on Type II waxes—those of microcrystalline structure. Only the second part of the request was granted.

The American Petroleum Institute, up to July 1, 1961, will have spent $400,000 on these tests.

This does not include the money that was spent by the Council on White Mineral Oil before it became, recently, a subcommittee of the API project, nor the money being spent currently by the Council on Petrolatum.

Both mineral oil and petrolatum enter into a large number of applications related to the production of foods, drugs, and cosmetics. For example, they are used:

- In the baking industry, as dough-divider oil, pan oil, and trough grease, and as a release agent in can linings.
- In the confectionery business, to make polished gum and panned confections.
- For food machinery, as lubricants and rust preventives.
- In the formulation of cheese coatings.
- As deduster and pelletizing lubricant for the manufacture of animal feeds.
- As a plasticizing agent for rubber and plastics used in conveyor belts, rollers, hose, and tubes that, in turn, are used in conveying food products.
- In the paper industry, as a moisture-proofing agent.
- In the tobacco industry, as an agent to release plug tobacco from its mold.

Except for the laxative effect of massive doses, no evidence is known of any adverse physiological effect from the internal uses of these products, according to the Petrolatum Council.

The Society of the Plastics Industry, and the individual manufacturers of films of petrochemical origin, are equally affected by the amendment.

Certain of these plastics have already been given a clean bill of health.

For polyethylene, of which 300-million lb. were used for food packaging in 1959, an official one-year extension has also been granted.

Esso Offers Petroleum-Base Jet Lube

A synthetic lubricating oil made with petroleum raw materials has been developed by Esso Research & Engineering Co. for use in jet aircraft.

The company says its synthetic lubricant has the highest stability in storage of any jet oil ever developed: It can remain in storage in tropical countries for several years without deterioration.

It performs satisfactorily at high temperatures—an average of 350F with some much hotter spots—and also at −65F. It is noncorrosive, and is compatible with rubber and seal materials.

The basic petroleum raw materials are olefins. These are synthetized into adipic diesters by the Oxo process (PW—May22'59,p28).

Esso Research has been working on the development and testing of a thermally stable jet lubricant for more than ten years. But up to now, the only oil Esso had developed that seemed to offer much promise depended on outside chemical manufacturers for about 75% of its raw materials. And Esso wanted to develop one that was entirely of petroleum origin. Now it has found one.

Immediately after World War II, Standard Oil Co. (N.J.) introduced the German Oxo process into the U.S. This process makes it possible to produce catalytically high-molecular-weight alcohols, starting with conventional olefins, which are available in quantity from refineries. In turn, these alcohols can be made into esters, or diesters, which are highly stable lubricants.

That is the process that Esso Research followed to develop the new jet lubricant.

Aircraft engine manufacturers that have tested it believe that it has better thermal stability and results in cleaner engines than Esso's somewhat similar lubricant of nonpetroleum origin.

Annual military consumption of jet engine lubricating oil is estimated at 1.5-million gal. And by 1962, engine manufacturers estimate, at least an equal quantity will be required for commercial flying.

What's New / IN PROCESSING AND PETROCHEMICALS

Sunray Mid-Continent Oil Co. has announced start up of expansion programs at three gas products plants.

In the company's Gulf Coast division, $900,000 will be spent to boost capacities at the Carancahua Bay plant, Jackson county, Tex., and the Benton plant, Bossier parish, La. Throughput at Carancahua is being doubled to 60-million cf/d. At Benton, an increase in propane recovery and higher quality residual products is planned.

At Sunray's Criner plant, McClain county, Okla., a $750,000 addition will bring plant capacity to about 30-million cf/d. Engineering work is being done by Tuloma Builders, Tulsa.

•

An antiseptic, bacteria-fighting polyethylene is now on the market. It's Dow Chemical Co.'s Surfaseptic, said to be especially effective as an active killer of disease-producing staph organisms. Dow researchers foresee a number of applications for the polyethylene, including toys, waste baskets, plastic door knobs, and portions of telephone headsets.

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Dow Chemical of Canada will build a petrochemical plant at its Fort Saskatchewan plant site, Alberta. The plant will produce pentachlorophenol, ethylene oxide, ethylene glycols, and ethanolamines. The pentachlorophenol unit should be operating late this year. The other facilities will be ready by late 1961.

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Nitrogen Division of Allied Chemical Co. will boost its output of methanol and formaldehyde. At the company's South Point (Ohio) plant, methanol capacity will be increased by 50% and formaldehyde by 35%. Methanol is used mainly in the production of formaldehyde, a principal ingredient in the manufacture of plastics and resins.

Texaco Inc. has come up with a new laboratory device that simulates lubricating conditions on large paper mill machines.

The test unit, designed and built by the University of Maine under contract from Texaco, can duplicate the lubrication problems on paper machines, which are often over 250-ft. long, and as high as a three-story building.

The testing machine heats bearings from within and then feeds condensed steam into its own lubricating system. It can place pressures and speeds on the bearings that exceed even those of a full-size machine, Texaco says.

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As much as $17-million may be invested in a polyethylene plant located at Amager, near Copenhagen, Denmark.

It will be operated in connection with the Marsk oil refinery. Projected producing capacity is 10,000 tons of polyethylene a year.

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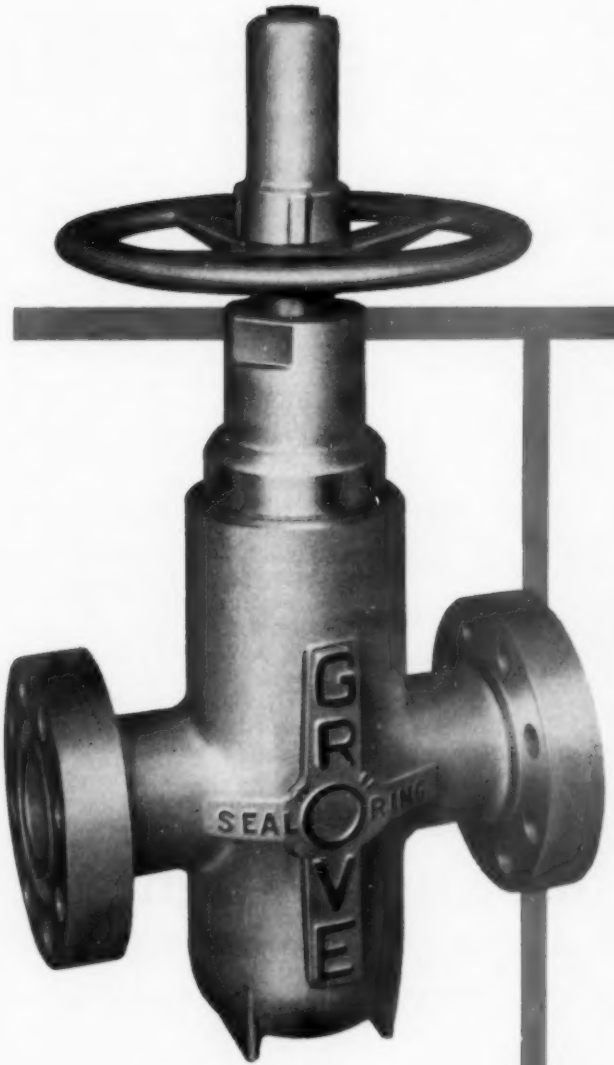

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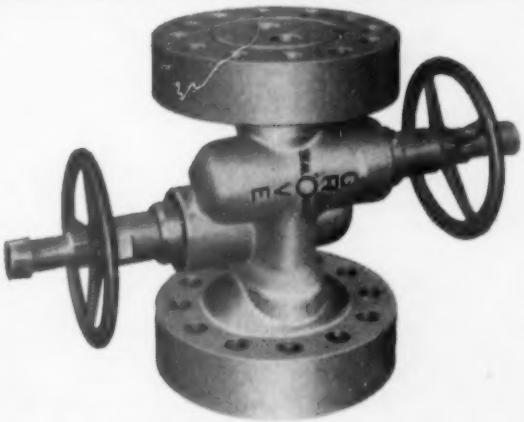

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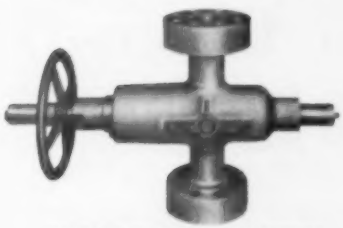

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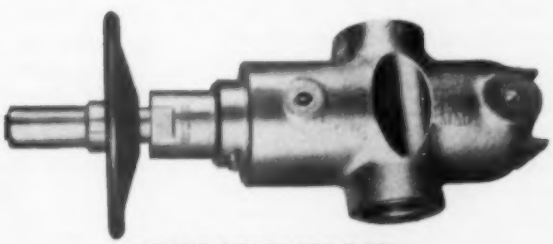

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6521

DEPT/International

USSR Says It Won't Slash Oil Prices

(By cable from PETROLEUM WEEK'S *Moscow Bureau)*

MOSCOW—The top Soviet oil export official says the Soviet Union is in the world oil market to stay, but claims it has "no intention" of playing the role of ruinous price-cutter.

This was the contention of Vladimir N. Gratchev, director of Sojuznefteexport, the All-Union Oil Export Board, in an exclusive interview with PETROLEUM WEEK this week.

The Soviets plan to continue producing more oil than they consume, he says, through and beyond the current Seven-Year Plan ending in 1965.

Exports, he says, will be no less than the current record level, though he will make no estimate on how large they may be in the future.

According to reports in the official Moscow press, Soviet exports of crude and products totaled 25-million tons in 1959, compared with 18.1-million tons in 1958—a 40% jump (PW—Mar.18'60,p80).

A large share went to Communist bloc countries. Major customers in non-Communist Europe included Italy, 3.5-million tons; West Germany, 2.2-million tons; France, 2-million tons; and Sweden, 1.5-million tons.

In addition to stepping up crude and products exports to Europe, the Soviets are expanding efforts for sales in Japan and Latin America.

Soviet oil export capability is growing as a result of pipeline construction from the Volga-Urals oil area to Eastern Europe and Baltic points, including the new oil port at Klaipeda. This is already being used for crude exports, although not at full capacity.

The pipelines will lower the cost of oil exports compared with shipments from the Black Sea, Gratchev says, but he does not say by how much.

Soviet oil export prices are set "in accordance with market conditions," the Russian official claims.

Normally, he says, they are pegged to Platt's Oilgram quotations, with a discount where those prices are not considered "realistic."

It is definitely "not right" to think that Soviet oil exports are intended to disrupt the world price structure, he contends.

The Soviet Union wants to get a good price for its oil, Gratchev says.

His country, he adds, is willing to sell crude and products under long- or short-term contracts, on a barter basis or for cash. He points to Spain and Portugal as examples of nations buying Soviet oil that have no trade agreements with the Soviet Union.

The Russian official sees no problem in Soviet competition with other world oil producers, including the Arabs. His point of view is that each country sells what it has.

Soviet planners themselves consider oil exports a prime means of getting foreign exchange for purchase of capital equipment abroad to help meet the ambitious goals of the Seven-Year Plan.

Exports of methane may develop in the future, Gratchev says, but he indicates that the necessary equipment is not available yet.

Large reserves of natural gas have been reported discovered in the Soviet Union. In fact, potential reserves were estimated last week at 55-trillion to 60-trillion cubic meters—or twice those of the U.S.—by another high Soviet official, Prof. Trebin, chief of the Science & Engineering Committee of the Russian Federated Republic. He would not give any figures on proved natural gas reserves, but said the estimate of potential reserves is made on the same basis as that used by the U.S. Bureau of Mines, which extrapolates from known reserves on the basis of the total potentially productive area.

Mattei, Others, Vie for Kuwait Rights

LONDON—The bidding will be hot for the first oil rights in the Persian Gulf off Kuwait, one of the choicest areas left anywhere in the world.

Bids were formally invited by the Sheikh of Kuwait this week, following earlier indications that he was interested in receiving "inquiries" about the offshore area (PW—Jan.22 '60,p64).

Onshore rights for the oil-rich sheikhdom are held jointly by Gulf Oil and British Petroleum. Actual bids for the offshore rights have never been invited before.

Enrico Mattei is making a stiff bid—reported as high as 80-20 in favor of Kuwait—in behalf of Italy's state-owned ENI group, which is already drilling across the gulf in Iran's waters.

Details are not known, but Mattei's offer, among four known to have been submitted so far, apparently goes beyond what he has frequently referred to as his "75-25" deal in Iran.

That deal follows the standard principle of sharing profits 50-50 between the government and the oil company. In addition, however, Iran's National Iranian Oil Co. is a 50% partner in the actual operations, sharing in both profits and losses once oil is found.

The Japanese-owned Arabian Oil Co. is also reported as bidding high for Kuwait offshore rights, though exact terms it is offering are not known.

It previously won Kuwait's share of its Neutral Zone offshore rights with a 57-43 profit-sharing bid, and Saudi Arabia's with a 56-44 bid that includes a commitment for integrated operations on an international scale.

The company recently made its initial oil strike on the acreage, which adjoins Kuwait's waters (PW—Feb. 5'60,p11).

Pan American International is a third early bidder.

The company, a subsidiary of Indiana Standard's Pan American Petroleum, is also drilling in Iran's waters, where it has had some shows in its initial wildcat. A second is about to be spudded (PW—Mar.18'60,p79). It won rights there with a $25-million bonus—on top of a government partnership deal similar to Mattei's.

The company's interest in the Kuwait offshore rights is not new. Indiana Standard was among the first to look into the question when Kuwait first asked for expressions of interest three years ago.

A fourth bidder is Cities Service, according to industry reports.

The company does not have oil

rights in the Persian Gulf area, though it was one of those that bid unsuccessfully for Iran's Persian Gulf acreage. It does, however, have a concession with Richfield in Dhofar, at the southern end of the Arabian peninsula.

The formal invitation for bids says the Sheikh of Kuwait does not wish to specify any particular form for the concession agreement.

Since offers may differ considerably in form, the invitation says, interested companies are asked to summarize their offers in "heads of proposals" to be submitted at companies' "earliest convenience."

The invitation is in the form of a letter dated Mar. 16, released this week by H. T. Kemp, the Sheikh's London representative. He advises that the Sheikh "is now interested in receiving offers from responsible companies or groups of companies for an oil concession" in the Kuwait offshore area, and that bids are invited.

The ruler has not yet fixed the date by which final offers will be considered and decided upon, will be considered and decided upon, but hopes to conclude the matter by November, Kemp's letter says.

The letter has been sent out both to companies that had expressed interest in the offshore rights three years ago, and to those that have come forward more recently. It ends with the request that Kemp be advised if "your company is interested in considering the acquisition of a concession" in the offshore area.

Aminoil, Getty May Coordinate

BEIRUT—A uniquely complex pair of operations in the Middle East may be simplified soon if American Independent Oil and Getty Oil work out a proposed coordination of their activities in the Neutral Zone.

Each company now operates there individually, as holder of a concession for an undivided half-interest in the whole area. Aminoil holds Kuwait's share, and Getty Saudi Arabia's.

So far, this situation has resulted in costly duplication of such facilities as pipelines, gathering installations, camps, and refineries. Drilling is also currently carried out separately under a complicated expense-sharing agreement between the two companies.

To cut costs of future operations, the two companies are now trying to work out some degree of coordination, subject to approval of the two governments concerned.

One step now under consideration: joint drilling by a single contractor.

As discussed at this stage, Aminoil proposes to sell its drilling equipment to a joint contractor, while Getty is considering leasing its equipment to the same company.

No firm decision on the question has been reached, although the two companies have been studying bids from several contractors.

For Aminoil, outright contract drilling would be an extension of its present operating method, but for Getty it would be a new departure from entirely company-run operations.

At present, Aminoil retains Santa Fe Drilling Co. as a contractor, but only for supply of drilling personnel. The company has also recently been contracting out more of its nonproducing operations—such as transportation—thereby reducing its own Neutral Zone personnel by about 50%.

A new exploration program planned for this year is one reason why the cost-cutting joint operations are being considered now.

A new seismic study is about to be undertaken in areas surrounding the Wafra field to pinpoint wildcat sites. Wafra is currently producing at full 130,000 b/d capacity.

Spain's Oil Grants Take New Turn

MADRID—More U.S. independents will have a stake in Spanish Sahara exploration, now that two blocks have been awarded to the U.S.-Spanish Valdebro.

The original bid for the blocks, 17 and 44, was filed jointly by the Spanish government's INI and General American Oil Co. of Texas. The final award, however, went to Valdebro, a bigger group, which includes INI and General American, plus several additional U.S. companies and individuals.

INI and the U.S. group each hold 50% interest in the company, which has been exploring in mainland Spain for several years. General American holds about 26% of the U.S. share, but current ownership of the rest is not being made public yet. It has already shifted in the past year (Caltex, for one, dropped a small interest), and other changes are being made.

Another shift in the Spanish picture: Pan American International has agreed—conditionally—to explore in mainland Spain as well as the Sahara, on the insistence of INI, its partner.

The two are being awarded Sahara Blocks 5 and 6, but the question of joint exploration in Spain isn't finally settled.

Pan American has now agreed to move into Spain proper under either of two conditions:

- Exploration of 200,000 hectares of INI's reserve area there, with INI holding only a 49% interest;
- Solo exploration of 100,000 hectares of INI's reserve area, or of another company's concessions.

U.S. and Libya Ex-Officials Team Up

LIBYA—A former U. S. ambassador to Libya and a former Libyan prime minister have teamed in a new consulting firm to advise oil companies on concessions and investments in Libya and other African areas.

The company is called Eastern Investments Consultants Inc. The U. S. partner is John L. Tappin, U. S. ambassador to Libya in 1955-58 and a former Assistant Secretary of Commerce.

The Libyan partner is His Excellency Mustafa Ben Halim, Libya's prime minister in the same period. Since then, he was ambassador to France until his resignation in February to go into private business, serving now as managing director of the new consulting firm's Eastern Hemisphere office in Tripoli.

A third partner, based in New York as director of the firm's Western Hemisphere office, is W. B. Uderski, an oil consultant and former director of the UNRRA petroleum division.

The new company will offer consulting services in shipping and other industries as well as oil, but not in engineering and construction.

Ben Halim's only connection with such operations is an association with Brown & Root, of Houston, and not with the Emile Bustani interests of Beirut as previously reported (PW—Mar.4'60,p65).

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5927

What's New / AROUND THE WORLD

EGYPT—Egypt's 70,000 b/d refining capacity will be nearly doubled by 1963 to 130,000 b/d, according to the Ministry of Industry. This includes addition of 20,000 b/d capacity at the 42,000 b/d Suez refinery of Anglo-Egyptian Oilfields, a Shell-British Petroleum affiliate. In the same year, Egypt's crude output will reach 138,000 b/d, rising to 170,000 b/d in 1965, the Ministry estimates.

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SARDINIA—Sardinia has just put into effect a new regional oil law with built-in preferences for state ventures—similar to mainland Italy's, rather than Sicily's.

Italy's INI and other companies with at least 30% state or regional participation can get twice as much acreage as private firms.

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SYRIA—An eighth test is about to be spudded in the Karatchok field, where five wells are now said to be producing a total 3,020 b/d. The field was discovered in northeast Syria by the Menhall-Atlantic Refining group, whose permits were taken over by the Syrian government. Drilling is now being done for the General Petroleum Authority.

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WEST GERMANY — Communist-bloc countries boosted their deliveries of oil products to West Germany by 36% last year, to 1,125,040 metric tons. Most of it was fuel oil; only 29,715 tons of it was crude. The exporters: USSR, Rumania, Poland, Hungary, Czechoslovakia, and Yugoslavia.

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EGYPT—Cairo announces that two of its oil officials will visit Venezuela and Mexico next month to discuss "oil questions"—as part of its current efforts to establish closer ties with Latin America. They are: Ahmed Kamel El Badry, managing director of the General Petroleum Authority; and Mohammed Ahmed Selim, general manager of General Petroleum Co.

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VENEZUELA—The Sun Oil group more than doubled its oil output in February, once again moving into fifth place among Venezuela's producers.

Other "newcomers" showed little change from January except for Superior, whose output was more than halved.

The month's total continued a gradual climb to 2,946,000 b/d, but the two-month average for 1960 still shows a continuing decline, by 4.3%, from 1959. Here are the government's official statistics (in 000 b/d):

Company*	Feb. '60	2-Mos. Avg. '60	2-Mos. Avg. '59
Creole	1,175.3	1,129.4	1,212.9
Shell (& Colon)	750.5	787.4	937.3
Mene Grande	455.4	448.0	404.6
Mobil	100.4	113.5	129.2
Sun	84.4	60.8	30.1
Texaco	59.7	57.7	54.6
Sinclair	58.8	46.5	60.8
Phillips	58.1	58.7	10.1
Richmond	52.2	48.5	60.4
San Jacinto	45.2	44.2	30.0
Signal	31.9	40.4	21.2
Atlantic	25.1	25.3	25.0
Mercedes	18.0	17.5	31.9
Superior	14.1	27.1	33.0
Coro	8.4	8.0	0.1
Caracas	7.4	7.1	0.1
Talon	1.1	1.1	1.5
Totals	2,946.0	2,911.2	3,042.8

*For joint ventures, total group production is listed under operator's name.

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SPANISH SAHARA—Tidewater Oil Co.'s operating base for Spanish Sahara exploration will be 120 mi. off the coast, in the Canary Islands, the company announced. It plans to start work immediately as operator on the eight blocks totaling 5-million acres that it was granted in a joint venture with Standard Oil Co. (Ohio). The two also have been granted one license in southwestern mainland Spain, near Seville.

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COLOMBIA—A Mobil-Texaco company has joined private local capital for Colombia's first natural gas project: a 140-mi. pipeline to the coast that will deliver an initial 20-million cu. ft. of gas daily to industrial consumers at Barranquilla.

Gas for the 10-in. line, costing $7-million, will come from the Cicuco field of Colombian Petroleum Co., owned jointly by Mobil International and Texaco. The new Gases Naturales de Colombia, S. A., will build and operate the line, which is scheduled to go into operation in late 1961.

Kuwait Output Cut

A sharp cut in Kuwait's production offset new records in Saudi Arabia and Iraq in February. The totals, in 000 b/d:

	Feb. '60	Jan. '60	Feb. '59
Kuwait	1,452.0	1,583.0	1,340.1
S. Arabia	1,245.8	1,221.2	1,112.0
Iran	1,002.0	993.0	825.0
Iraq	916.5	899.7	803.8
Qatar	184.4	182.6	176.6
Total	4,800.7	4,879.9	4,257.3
2-Mo. Avg.	4,841.6	———	4,226.0

FINLAND—British Petroleum Co.'s brand will make its first appearance in Finland. BP will acquire 50% of OY Petko A/B for cash, renaming it BP Petko OY. A Helsinki firm, Petko now trades chiefly in black oils. It has been supplied with fuel oils and gas oils by BP for years, and has also been BP's bunkering agent.

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INDONESIA—A "significant" new discovery was made by Caltex in Sumatra last year, Texaco reports. The wildcat was completed in June at Pematang, 9.9 mi. west of Caltex's Duri field. No details have been released.

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USSR—The Russians have found six promising oil zones in Uzbek underlying the Soviet Union's biggest proven natural gas reserves near Gasli, according to the East German News Agency in Berlin. It says that each of five exploratory wells completed in the area is flowing 100 metric tons of crude daily.

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Wildcats In the News

PHILIPPINES—A new wildcat has been spudded on Panay Island by Philippine Oil Development Co. The No. 1 San Miguel will be a 7,500-ft. test 5-mi. north of No. 1 Oton, drilled in 1953, and 5 mi. north of No. 1 Tigbauan, which found gas late last year.

LIBYA—Caltex's 5-mi. extension of its Beda discovery has tested 660 b/d of 36.4-gravity oil in two hours, open flow, from around 3,744 ft. (PW—Nov.27'59,p37). No. 2 Beda, which is 30 mi. southwest of Esso's Zelten finds, is now shut-in. No. 3 Beda is being drilled. No. 1 Beda, to the south of No. 2, was completed for 3,650 b/d.

Plastic Pipe Scores High in Field Use

- **Phillips reports high-density polyethylene pipe outperforms steel in certain applications.**
- **Some advantages cited are low installation cost, high strength, and resistance to corrosion.**

High-density polyethylene pipe has won high endorsement from a major oil company for several low-pressure petroleum transportation uses.

High-density polyethylene is a relatively new product. It differs from other polyethylenes in molecular structure. In high-density—or linear—polyethylene, the ethylene molecules are organized in an orderly fashion in long straight chains, whereas in other kinds of polyethylenes, the ethylene molecules are loosely branched.

The linear is by far the stronger of the two structures, resulting in a product of high tensile strength and melting point, and great toughness (PW—Aug.14'59,p51).

Phillips Petroleum Co. reports outstanding results in the use of the pipe in gas gathering and distribution lines, and in crude gathering lines.

The results of field tests were disclosed by Leo B. Croley, commercial development engineer for Phillips, at the recent meeting of the Southwest District of API's Division of Production, in Dallas.

The pipe is made of Marlex TR-212, which is Phillips Chemical Co.'s polyethylene.

Phillips has been experimenting with the pipe for five years. The company first put it into field operation in 1958. By last year, Phillips had laid over 80 mi. of the pipe. About 60 mi. of it were in gas gathering lines; the rest comprised crude gathering and gas distribution lines.

Diameters of the pipe studied ranged from 2 in. to 8 in.

The high-density polyethylene pipe demonstrated eight characteristics that gained its recommendation from Phillips for commercial use. They are:

Low initial cost: Two-inch-diameter Schedule 40 pipe costs a maximum of 40¢ a ft., or less than Schedule 40 steel pipe.

Light weight: A 20-ft. joint of Schedule 40 pipe of 6-in. diameter weighs only 46 lb., compared with 368 lb. for a like section of steel pipe.

Rigidity: While not as rigid as steel, polyethylene pipe is rigid enough to permit lengths of 40 ft. to be handled without breakage.

Impact strength: The impact strength of the pipe far exceeds requirements for field handling and installation, even at below-zero temperatures.

Toughness: The pipe is so tough it can be squeezed in a vise and turned 90 degrees without breaking.

Corrosion resistance: There are no known corrosive soils to which the pipe is susceptible, says Phillips. This means that it doesn't have to be coated or wrapped.

Electrical resistance: As a nonconductor, the pipe is not subject to electrolytic corrosion, and therefore does not require cathodic protection.

Slick inside walls: High-density polyethylene produces a very smooth inside wall, which boosts fluid flow and cuts scale build-up.

While yield strength of high-density polyethylene pipe is only a fraction of that of steel pipe, Phillips has found it to be high enough for gas gathering lines.

The plastics industry has set 600 psi. at 73.4F as the design hoop stress for linear polyethylene pipe.

In one test of the plastic pipe after it had been in use for 1,000 hours, according to Phillips, it was found to have a rupture stress under hydrostatic pressure of 1,800 psi. at 80F. Thus, the design safety factor of the pipe, compared to the standard design hoop stress, is greater than 3-to-1.

Phillips emphasizes that at temperatures below 73.4F the pipe is much stronger and can be used at higher pressures. On the other hand, at higher temperatures, the pipe weakens, and the pressure must be reduced.

An added advantage of high-density polyethylene pipe is that, because of its immunity to corrosion, gradual weakening of the walls from that cause doesn't have to be taken into account when figuring actual working pressures.

In the case of steel pipe, the effect of corrosion must be allowed for by designing walls of higher yield strength than will be needed initially. Yield strengths of steel pipe—particularly that used for long-distance transmission lines—are vastly higher than those of polyethylene pipe. Big-diameter steel pipe is now available in yield strengths ranging from 46,000 psi. to 56,000 psi.

One of the greatest appeals of polyethylene pipe, Phillips feels, will be its low cost of installation.

Tests with 3-in. diameter pipe showed that it cost 15¢ a ft. to lay the thermoplastic pipe, as compared with 35¢ a ft. for steel pipe.

While the cost of polyethylene pipe of four different wall thicknesses was from 12¢ to 14¢ a ft. higher than that of comparable steel pipe, the total cost of the job, including pipe and installation was lower when using the plastic pipe.

For example, total installation cost of a foot of the cheapest comparable 3-in.-diameter steel pipe is 89¢, compared with 84¢ for polyethylene pipe.

The saving in installation costs results from two factors: a great reduction in the manpower and equipment needed to lay the lighter polyethylene pipe, and elimination of the need for corrosion protection.

The cost of stringing out, welding, and burying 3-in. steel pipe is 25¢ a ft., Phillips reports. Cathodic protection and coating amounts to another 10¢.

Cost of laying polyethylene pipe is only 13¢ a ft., plus another 2¢ a ft. for joining sections.

A length of several 40-ft. joints of high-density polyethylene pipe can be handled and put in the ditch by two men, according to Phillips, whereas a length of 40-ft. sections of steel pipe would require heavy equipment to set it in place.

Phillips says that some swamp crossings have been made by two men laying the polyethylene pipe (by pushing or pulling) in sections 1,000 ft. long. The fact that no machine is needed to install the pipe is a big advantage in marshy areas, since machinery often bogs down, or gouges the right-of-way.

Like steel pipe, the polyethylene pipe can be installed either above-or underground. A buried line is preferred, however, because it's protected from vehicles, and, as Phillips notes wryly, "stray bullets and whittlers."

The same size ditch can be used for

plastic pipe as for steel pipe, of the same diameter, except that more leeway must be allowed in making curves. Ditch curvature and grade changes for overbends and sags are acceptable up to a radius of 25 times the outside diameter of the pipe.

Sections of polyethylene pipe are joined in the field by a simple method called "butt fusion"—fusion of the ends by heat and gentle pressure.

Phillips claims that the method requires neither skill, strength, nor complex equipment.

Here's how a joint is made: The ends of the sections are wiped clean, and are cut square so that they will meet uniformly. The butts are pressed against an aluminum plate heated to between 380F and 410F until a bead about 1/16 in. in diameter forms and begins to roll back away from the plate. Then the ends of the sections are pulled away from the plate and pressed "gently" together for about 30 seconds. At the end of that time, the melted plastic has already hardened, and the joint is made.

To simplify the process even further, portable "fusion" units have been developed. Main feature of these units is that they are equipped with in-line facers, simultaneously squaring the ends of the sections to be joined, Phillips says.

What's New / IN PIPELINES, TANKERS, STORAGE

Opposition Mounts To U.S.-Flag Plan

Standard Oil Co. (N.J.) warns that adoption of the pending proposal to require that 50% of oil imports be carried in U. S.-flag tankers would boost the industry's shipping costs by $100-million a year.

In a petition to the Office of Civil & Defense Mobilization last week, Standard cited the staggering cost increase as its main reason for opposing the plea of two groups of owners of U.S.-flag tankers (PW—Feb.5'60,p49).

The company's conservative estimate is that rates on the guaranteed imports would be 65% higher than the current rates of foreign-flag ships.

Of the 50% plan, Standard says, "What is being proposed is simply a subsidy for a small group to be financed not from public funds, but by a direct levy on oil importers and oil consumers, and at the risk of unfortunate world-wide repercussions."

The American Committee for Flags of Necessity has also registered sharp opposition to the proposal.

In the first place, ACFN says, it's doubtful that the U.S.-flag ships have the capacity to carry 50% of imports. This would create a "runaway tanker charter market," it asserts, which would benefit only the U.S.-flag ships, since other vessels would be barred from competition.

Moreover, ACFN warns, this kind of discrimination would spark "foreign reprisals" against all U.S. shipping.

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Texas Electric Service Co. has awarded a contract for the construction of its 370-mi. intrastate gas pipeline to boost supplies to its generating plants in the Fort Worth and Graham areas (PW—Apr.17'59,p17).

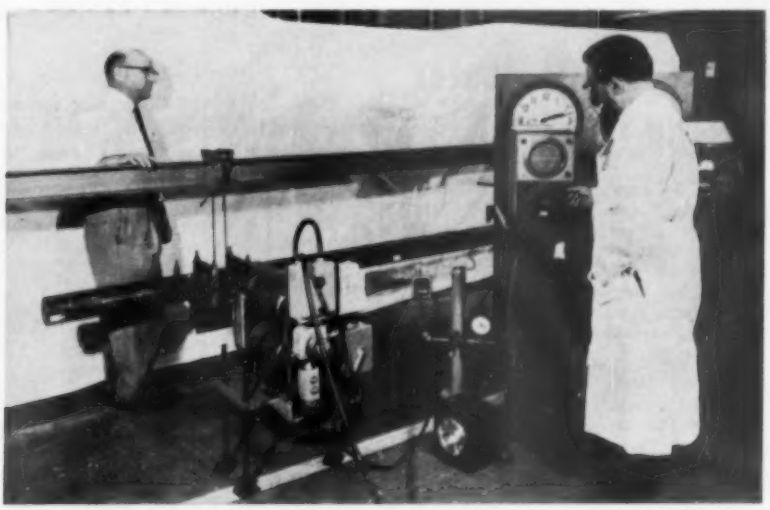
The $25-million line will be built by H. B. Zachary Co., San Antonio, and O. R. Burden Construction Co., Tulsa. Old Ocean Fuel Corp., a Texas Electric subsidiary, will supervise construction.

The line will move about 250-million cf/d of gas from fields in Matagorda and Brazoria counties.

•

Westalta Products Pipe Lines, Ltd., has asked authority to spend about $35-million to build the first section of a proposed 188,000 b/d LP-Gas line from Alberta to the U. S. Midwest (PW—Mar.18'60,p63).

Westalta's petition to the Alberta Dept. of Mines & Minerals was one of several developments last week in a growing move to secure new outlets



Vibrations Used to Test Pipe Wear

Vibrations being induced in this 4-in.-diameter steel pipe simulate years of fatigue in a matter of minutes in a resonance bending test to determine its point of fatigue failure. The new test was developed by the Tube Turns Division of Chemetron Corp.

A pipe's point of fatigue failure is the point at which it cracks and permits air leakage. In the Chemetron test, a section of pipe, sealed at both ends and under 10 psi. pressure, is suspended freely from beams. Under one of the points of suspension, weights are spun by an electric motor, which cause the pipe to vibrate in its natural resonance frequency. Eventually, the pipe cracks, and a pressure drop of 1 psi, automatically shuts off the motor. A million operating cycles in a piping system can be duplicated by resononce bending in a little over four hours, the company says.

Quaker Thermoid FLOATER HOSE AT WORK IN FROBISHER BAY

Quaker Thermoid **600 foot continuous-length Floater Hose speeds ship-to-shore oil transfer!**

Increased air traffic over the polar route has called for an immense new airfield and oil-piping system at Frobisher Bay, Baffin Island, just completed by Foundation Company of Canada Limited.

Tankers pump petroleum products through a 600-foot Thermoid-Quaker Floater Hose assembly to a 15,000-foot pipeline feeding the huge tank farm at Frobisher. An 8" Thermoid-Quaker discharge hose is floated on special inflatable Thermoid-Quaker pontoons and reeled on a power winch. This three-part rig makes up the complete Thermoid-Quaker assembly.

You do away with bulky metal drums for floating hose when you use this new Thermoid-Quaker rig. Inflatable floats take up less than a quarter of the space formerly required by floating drums. And the hose comes in such long sections that couplings are reduced by as much as 90%.

If you load or unload tankers off-shore, investigate the Thermoid-Quaker Floater Hose combinati n. Ask the Thermoid distributor, or write *Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Sts., Philadelphia 24, Pa.*

THERMOID PORTER DIVISION

H.K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION, PEERLESS ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—COLDFORM DIVISION, DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, H. K. PORTER COMPANY de MEXICO, S. A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

for the LPG production of 96,000 b/d that is expected to result from the proposed gas exports to the U. S. (PW—Mar.4'60,p68).

The section of the line to be built by Westalta would extend from Kaybob south to Pincher Creek, then east to the Saskatchewan border.

Foothills Pipe Lines, Ltd., another subsidiary of Pembina Pipe Lines, Ltd., would build the 16-in. line to the North Dakota border.

There's talk that a third company might be formed to build the section to the Chicago area—main market target for the LPG.

Meanwhile, Hughenden Pipeline, Ltd., quietly filed application for a domestic system to tap liquids from at least four major gas fields for local Alberta consumption.

And there's also a rumor that the Alberta government itself is considering building an LPG line for domestic shipments and exports.

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Sinclair Oil & Gas Co. will develop a 100,000 bbl. storage cavern for LP-Gas near Hutchinson, Kan.

The cavity will be washed out of a salt formation at an estimated depth of 650 ft.

The LPG will move to Upper Midwest distributors by rail and truck.

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Dehli-Taylor Oil Corp. has sought approval to sell gas from Zapata and Starr counties, in South Texas, to Tennessee Gas Transmission Co.

Gulf Resources, Inc., and Natural Gas Gathering Co., two Dehli-Taylor subsidiaries, would build a gathering system to move the gas to TGT at the rate of 70-million cf/d.

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Engineering

A method of fluoroscoping welded seams of steel pipe to detect flaws has been developed by the National Tube Division of U. S. Steel.

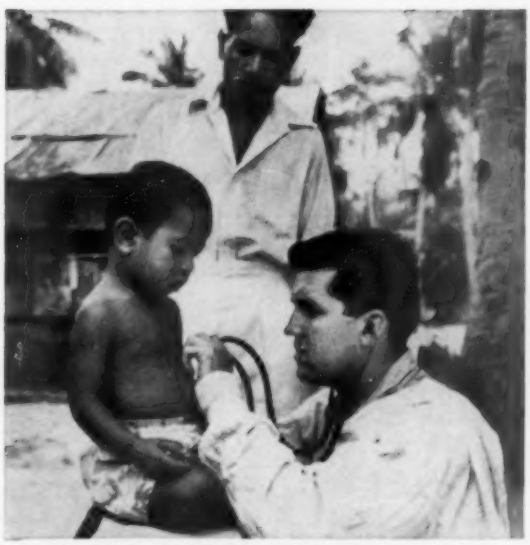
Formerly, the company checked welds by X-ray—a common technique. With this method, however, film had to be developed, which slowed the inspection.

In the new method, an X-ray head is inserted in the pipe. The pipe is then passed in front of a fluorescent screen, on which an image of the weld is projected. When a flaw appears, an inspector simply presses a button, which causes the defective portion to be sprayed with white paint.

This great seaborne health center will carry a new kind of aid abroad—*with your help*. Part of the people-to-people project Hope, it will enlist 200 specialists in sharing our health skills.

Ambassador with a blackboard, the Hope specialist will help the often woefully few local medical technicians train helpers. The result: many more hands. And that means one Hope dollar is multiplied many times over.

YOUR HELP CAN COME BACK A HUNDRED TIMES OVER



One local doctor for 100,000 people. These are the odds Hope may face. Yet Hope can mean so much. The health of this child. The health of five Indonesians. *Trained* hands and only a dollar's worth of penicillin can cure them of crippling yaws.

If enough of us help, the S.S. Hope will be outbound in 1960. First port of call: Indonesia. A bold health project called Hope will be underway.

The need is crucial. Many places, too many health hazards exist. Too many people robbed of the will to live. Too few hands to help. Often, a doctor for 100,000.

Hope's approach is *practical*. Help where a nation's doctors ask help. Help them help themselves to health. By training, upgrade skills—multiply hands. Hope's doctors, dentists, nurses, and technicians will man a center complete to 300-bed mobile unit and portable TV.

You can not only make every dollar do the work of many, you can earn a priceless dividend. With health comes self-respect. People at peace with themselves are less likely to war with others.

Hope is *yours* to give. It's a people-to-people project. For one year's worth, 3½ million Americans must give a dollar. Don't wait to be asked. Mail a dollar or more now to HOPE, Box 9808, Washington 15, D.C.

HELP LAUNCH HOPE

DEPT/Marketing

Electronic 'Code' Cuts Delivery Costs

A major oil company is testing a new control system that promises optimum utilization of delivery equipment to service stations.

The new system, known as the Smithway Marketing System, was developed by A. O. Smith Corp.'s Smith-Erie division. The interested oil marketer is testing the system at its service stations located near Erie, Pa.

With the system, suppliers can deliver full loads of gasoline or diesel fuel to their dealers—even if the dealers aren't prepared to pay for all they receive.

A certain amount of the delivered fuel is allotted to the dealer, depending on his ability to pay. The rest is "locked" into the dealer's tanks, and stored there until he is ready to pay for another allotment.

In this way, suppliers avoid the costly problem of small deliveries, and are able to make the most efficient use of their delivery personnel and equipment, says A. O. Smith.

The system also avoids the problem of having to extend credit to dealers unable to pay for all their fuel on delivery.

The heart of the system is a decoding device, which translates each dealer's order for more fuel into a code number.

Here's how it works:

The dealer checks a specially installed control panel at his station, which tells him that his allotted supply is running low. He then mails a request for another allotment to his supplier, together with a payment for the additional fuel.

Upon receiving the order, the supplier inserts a business machine card into the decoder. In this way, the supplier records the release of more fuel to the dealer, and also updates a perpetual inventory of unallotted product still at the station.

In addition, the decoder furnishes a code number, which the supplier telephones back to the dealer.

This is the key step. The code number, when punched into the dealer's 12-key control panel, will release to the dealer the amount of fuel he has paid for.

A pump manufacturer who has unsuccessfully tried to market a similiar control system has depended upon intermediary personnel to release the dealer's tanks.

Suppliers will have to weigh the savings achieved with the system against installation costs that will vary depending upon operating conditions and the number of fuels dispensed at their service stations.

A control and electronic transmitter for each tank must be installed at service stations for each fuel to be placed under the system.

The Smithway system will probably prove most attractive in areas where delivery costs are high.

However, the system will also operate efficiently where dealers have established credit with their suppliers, says A. O. Smith: The system records all pertinent data regarding inventories and enables the supplier to tell "well in advance" when their credit dealers will reach the limit of their open accounts.

Supplier Bypasses Storage Tanks

Standard Oil Co. (Ind.) has perfected a distribution system that permits tankwagon drivers to tap its pipelines and draw off products as they flow by.

The marketer has found that distribution costs are appreciably cut by using these "tankless terminals."

At Trenton, Mo., where Indiana Standard has been operating a tankless terminal since October, 1958, unit operating costs are lower than at any other of the company's 34 terminals. Furthermore, the company invested less than $50,000 in the Trenton terminal—roughly one-tenth of what it would have cost to set up a conventional terminal of comparable volume (363,000 bbl. a year).

Another saving is in personnel: Only one employee, a supervisor, is stationed at Trenton, where two would normally be required. Some of the company's larger terminals employ up to 40 men.

Besides the one now in operation, Indiana Standard plans three more tankless terminals for 1960. One at St. Joseph, Mo., where construction will begin shortly, and two others in Michigan. In addition, a smaller modification is planned for Cedar Rapids, Iowa.

At this plant, storage tanks for gasoline will be built to handle enough fuel to take care of local needs when heating oil is running through the line. The Cedar Rapids terminal will supply service stations directly. All the other tankless terminals deliver to bulk plants.

The tankwagon drivers operate the terminals themselves and deliver the gasoline or heating oils to nearby bulk plants. At Trenton, four tankwagon drivers work on a shift. When one of the drivers arrives at the terminal, he checks with the supervisor who tells him which of the 50 nearby bulk

NO STORAGE TANKS greet this tankwagon as it pulls into Indiana Standard's Trenton (Mo.) terminal. In the shack (behind the truck), the driver can call Chicago to determine which product is flowing through the underground pipeline. The rack (background), which is connected directly into the line, is unlocked automatically from Chicago.

plants need a delivery. Then the driver calls Indiana Standard's main office in Chicago.

"This is Bendix at Trenton. I have an order for Red Crown gasoline," he may say.

Chicago checks to see what product is flowing through its Sugar Creek-Dubuque line at that time. If it's the right product, a Chicago dispatcher dials a code number on a telephone-type dial, which releases a motor-operated valve at the Trenton terminal. If the wrong product is passing through, the driver is sent to an alternate terminal.

The driver then inserts a key into a meter head and turns it, making it possible for him to open the valve with his loading ticket. The valve will automatically close when his order has been filled. To reduce the pressure at the take-off point, the terminal has been fitted with pressure-reduction valves.

Tankless terminals are most practicable in areas that would make limited demands on the pipeline's capacity.

Since the pressure drops every time a take-off is made, the number and size of terminals must also be limited. At Trenton, tankwagons can load 500 gal. per minute, while Sugar Creek refinery pumps at the rate of 40,000 b/d.

The tankless terminals probably would not prove economical in areas where low truck rates make deliveries from conventional terminals less costly.

Furthermore, tankwagon distributors would not be able to tap common carrier pipelines, in which one marketer's products may be flowing through the tankless terminal only one-tenth of the time.

Because of these limitations, the growth of tankless terminals is distinctly limited. Indiana Standard admits that it has already "skimmed off the top" of its potential use of them, and plans no more beyond the four already scheduled.

Key Stops Stabilize Deliveries

Several oil marketers are discovering that it's cheaper to supply service stations at regular intervals—and collect for the product at a later date.

In the Southwest, Gulf Oil Corp. started such a program in 1959. It now has roughly 65% of its stations in that region on what it calls its "bailment program."

Continental Oil Co.'s "key-stop" program, started in the company's northern region in May, 1958, has spread to all regions. Thus far, 600 Conoco stations are in on the plan.

Several other companies are experimenting with similar plans.

The main purpose of the plan is to allow suppliers to schedule their delivery equipment for optimum utilization.

By freeing themselves from dependence on their dealers' fluctuating orders, suppliers can deliver whenever they want to. This often means night deliveries, when some stations are closed.

To make such deliveries possible, tankwagon drivers carry keys to the stations' underground tanks. Stations included in such a program are often called "key-stop" stations.

The program often shifts the financial burden of storing fuels at service stations from the dealer to the supplier.

In Continental's plan, each dealer's pump meters are read by company representatives, and the dealer is billed only for the fuel he has sold.

Other plans require tankwagon drivers to leave an invoice at each station, asking the dealer to pay within a specified period.

But the program frees the supplier from some of the adverse affects of gasoline price wars.

Many terminal operators have to hire extra crews just to keep up with price war deliveries.

"Our management looks at a 1-million-gal. delivery day and thinks we are doing great," says one terminal operator in a large company. "Actually, we probably lose money on such big days."

With the scheduled delivery plan, suppliers may also avoid recurrence of price wars. "When a dealer purposely stocks with 9¢ and 10¢ gasoline bought during a just-ended price war, he's tempted to whittle a cent or two to get more business," says one Southwest marketing executive.

Some dealers object to the plan because they cannot vary their purchases with fluctuating prices.

One supplier is considering a "cushion" period to overcome this objection. Here, dealers would be charged the lowest delivery price occurring within a certain period, instead of the price current at the time they receive their shipments.

What's New
IN MARKETING

An oil-fired air conditioner is being marketed in the South by Arkla Air Conditioning Corp., Little Rock, Ark.

This "Sun Valley" oil unit is essentially an oil-fired version of Arkla's present absorption-type, gas-fired air conditioner. The main difference is the substitution of an oil burner for a gas burner.

The converted unit requires additional piping and a storage tank for oil. But in homes where oil is used already, the oil-fired Sun Valley will sell at prices only slightly above those of the gas-fired version.

Arkla, a subsidiary of Arkansas Louisiana Gas Co., will display its air conditioner at the Oil Heat Institute's products show, April 4-7, in New York.

•

Sen. Warren Magnuson (D., Wash.) introduced three oil marketing bills last week that are identical to Rep. James Roosevelt's bills.

One bill would bar direct retail marketing by integrated oil companies. Another would limit the influence of oil marketers on the distribution of tires, batteries and accessories. A third bill would require the filing of dealer leases with the Federal Trade Commission.

The bills have been referred to the Senate Interstate Foreign Commerce Committee, which Magnuson heads.

Meanwhile, Rep. Roosevelt (D., Calif.) has made public the text of the marketing hearings his House small business subcommittee held in December (PW–Dec.18'59,p62).

He is sending copies of the texts to major oil suppliers, in anticipation of rebuttal hearings expected next month.

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Trading stamps—recently cited as a cause of a Los Angeles price war—now are credited with imparting stability to the market.

General acceptance of stamps—completed when Standard Oil Co. of California capitulated earlier this month—is seen as a main factor in lifting prices out of their recent 5¢-7¢-a-gal. slump.

But in January, when Blue Chip stamps started flooding the market, dealers who did not offer stamps started cutting prices to compete.

At one point, the state's Attorney General announced that he was investigating the struggle.

But now 95% of the dealers offer stamps, and the war is over.

DEPT/Service & Equipment Companies

E. DON TULL has been elected president of Cummins Engine Co., Columbus, Ind. He succeeds **R. E. Huthsteiner**, who has resigned. Tull, with Cummins since 1928, became manager of manufacturing in 1950. In 1952 he was promoted to vice-president and general manager, and in 1955 was named executive vice-president.

R. N. Waters

E. D. Tull

R. N. WATERS becomes secretary-treasurer of Baker Oil Tools, Inc., Los Angeles. He succeeds **J. E. Rosenlind**, who, after 32 years' with Baker, will serve in an advisory capacity. Waters, who joined the company in 1940, became assistant secretary-treasurer in 1958.

JACK D. TOLLIVER has been promoted to the newly created position of field sales manager for the Tube Turns Division of Chemetron Corp., Chicago. Tolliver, formerly Eastern regional sales manager, will be responsible for sales in all U.S. district office territories. Tolliver joined the division in 1949, and became manager of sales development when that department was organized in 1955. He was named sales manager for the Eastern region in 1958.

JERRY D. HAWSEY is the new technical sales representative for Continental Oil Co.'s petrochemical department oilfield sales organization. He will supervise sales activities for Conoco's Adomite, in the Texas Panhandle, South Plains, and Denver City areas of Texas, and the Four Corners area of New Mexico and Colorado. Hawsey joined Conoco last year at Pampa, Tex., where he will continue to be located. Before that, he was an engineer for Core Laboratories, Inc.

KENNETH S. BAYLESS has been appointed vice-president, sales, for Cal-Metal Pipe Corp. of Louisiana, Baton Rouge, and **Leonard C. Wahlenmaier** has joined the company as manager of the Midland (Tex.) sales office. Bayless, who joined the company last year, was formerly assistant sales manager. Wahlenmaier has been active in the oil industry in the Midland-Odessa area for the past 13 years.

NOBLE D. LANE is the new manager of the South Texas division of Continental-Emsco Co., with offices in Houston. **James W. Dees** succeeds him as district manager at Lafayette, La. Dees was formerly store manager at Houma, La. **Harry Hobbs, Jr.,** becomes assistant general merchandise manager. He has been division merchandise manager at Houston. **A. L. Beavers,** formerly district production machinery specialist, succeeds Hobbs at Houston. **L. R. Walker** becomes division merchandise manager of the South Louisiana division, at Harvey, La. He was formerly store manager at Lake Charles, La.

AARON D. BAKER, Mexia, Tex., has been named assistant to the executive secretary of the Assn. of Oilwell Servicing Contractors. Baker, who retired from Humble Oil & Refining Co. in 1958, was formerly safety engineer for Dapsco, Inc., Laurel, Miss. In his new position, he will act as field representative for the association, and assist in coordinating its safety program.

R. P. Burton

C. B. Evans

CHARLES B. EVANS is the new Permian Basin manager, and **RALPH P. BURTON** succeeds him as northern Rocky Mountain division manager, for Schlumberger Well Surveying Corp. Evans moves to Midland, Tex., to replace **F. L. Bryan,** who has been named director of personnel relations, with offices in Houston. Bryan succeeds **Gordon W. Watson,** who has been transferred to Schlumberger, Ltd., Burton, who was formerly Southwest area assistant manager, moves to the northern Rocky Mountain headquarters in Denver.

NOMINEES for four directorships in Union Tank Car Co., Chicago, are: **Bennett Archambault,** chairman and president of Stewart-Warner Corp.. **Robert P. Gwinn,** president and general manager of Sunbeam Corp.; **William V. Kahler,** president of Illinois Bell Telephone Co.; and **Kenneth V. Zwiener,** president of Harris Trust & Savings Bank. The election will be held at Union Tank Car's annual meeting in April.

W. E. RIDGEWAY, consulting drilling engineer with headquarters in Beirut, Lebanon, has been appointed Middle East technical sales representative for Byron Jackson Tools, Inc. Ridgeway, who set up his independent organization in Beirut last year, is also exclusive representative for Hughes Tool Co. His territory covers the Middle East, south to British Somaliland and west to the Libyan-Egyptian border.

WAYNE OVERMAN has been named manager of Tuboscope Co.'s Shreveport (La.) district. Overman, who recently opened the new office in Shreveport, will be responsible for sales and service in Arkansas and northern Louisiana. Overman has been field superintendent for Tuboscope's Harvey (La.) district.

W. Overman

W. L. Porter

WELDON L. PORTER has been promoted to the newly created position of chief completion services engineer for Welex, Inc., with offices in Ft. Worth. Porter, who has been with Welex for the past six years, was most recently city salesman in Dallas. In his new position, Porter will give assistance to customers in solving well completion problems. His duties in cased hole services are similiar to those of chief formation evaluation engineer **Terry Walker,** who specializes in open hole work, and is located at Welex's Houston Research & Engineering Center.

C. ERIC HO is the new manager of catalyst sales and development for Climax Molybdenum Co., a division of American Metal Climax, Inc., New York. In addition to his marketing responsibilities, Ho will provide developmental assistance and technical service to catalyst manufacturers, petroleum refiners, and chemical manufacturers. Ho, with Climax since 1958, has been assistant director of marketing research.

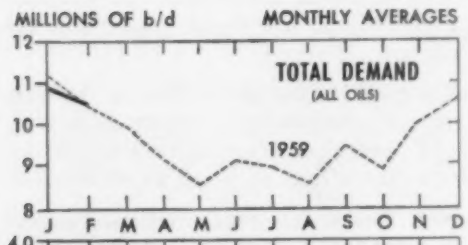
C. E. Ho

R. F. Brown

ROY F. BROWN is the new marketing manager of the Scientific & Process Instruments Division of Beckman Instruments, Inc. Brown joined Beckman as Eastern regional manager for process instruments in 1956, and transferred to the division's Fullerton (Calif.) headquarters in 1958 as field sales manager of process instruments. In 1959 he was appointed process sales manager for the entire division.

PETROLEUM WEEK'S

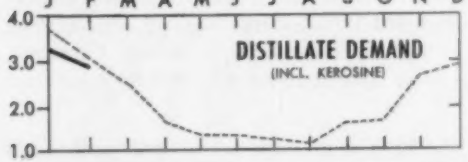
Fingertip Figures



Figures for period ended March 18, except as noted

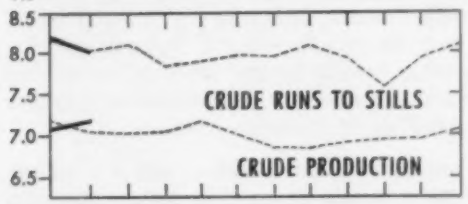
TOTAL DEMAND

Latest 4-week average	10.938
Year ago	10.139



DISTILLATE DEMAND

Latest 4-week average	3.381
Year ago	2.758

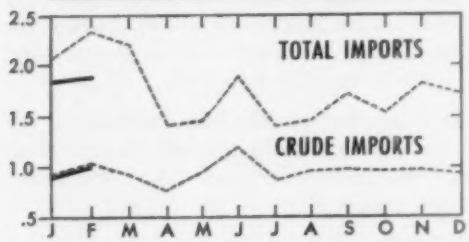


RUNS TO STILLS

Latest week	7.857
Previous week	7.782
Year ago	8.082

CRUDE PRODUCTION

Latest week	7.116
Previous week	7.049
Year ago	7.203

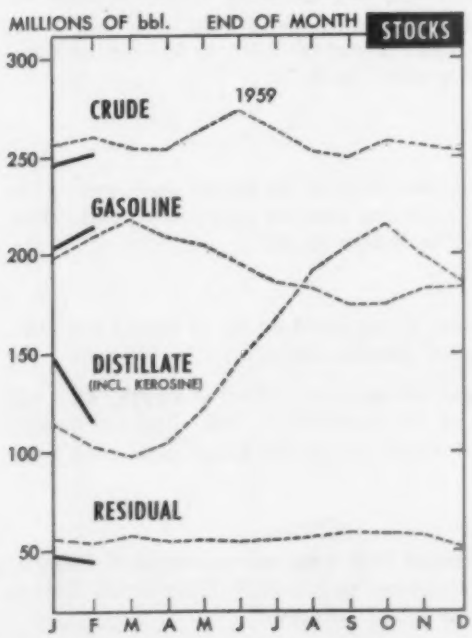


TOTAL IMPORTS

Latest week	1.957
Previous week	1.766
Year ago	1.932

CRUDE IMPORTS

Latest week	.993
Previous week	.875
Year ago	1.046



CRUDE STOCKS

Week ended 3-12	254.2
Previous week	252.7
Year ago	255.7

GASOLINE

Latest week	224.5
Previous week	221.1
Year ago	212.1

DISTILLATES

Latest week	101.2
Previous week	111.7
Year ago	95.5

RESIDUAL

Latest week	41.0
Previous week	43.2
Year ago	55.1

The March cold snap is proving to be a shot in the arm for the industry. It pushed total demand last week to 11.4-million b/d—just 661,000 b/d short of the all-time peak set in mid-January, 1959.

Distillates demand was up to 3.7-million b/d last week, the highest level since December, 1958. The long-awaited drain on heating oil stocks has brought inventories of distillates and kerosine down 25-million bbl. since the end of February.

This will be the coldest March in 50 years, according to one company's tabulation.

For the entire 1959-60 heating season, so far, however, temperatures have averaged only 2.5% colder than "normal," measured on a degree-day basis, and almost 1% colder than the 1958-59 season.

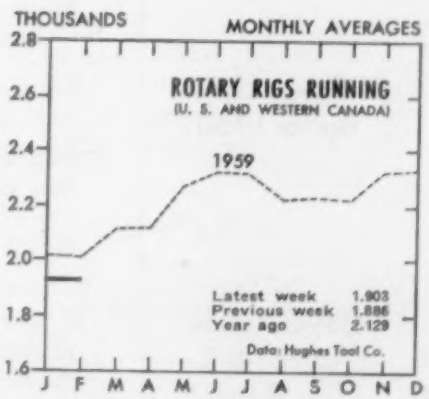
The East Coast and the Great Lakes regions had fewer degree days than last year, but more than normal. The Midwest, West Coast, and Southeast had more degree days than a year earlier, and more than normal.

The East Coast, most important marketing area for distillates, had 98 fewer degree days than last winter.

The improvements in inventories resulting from heavy distillates withdrawals are being offset partially by growing gasoline stocks, now at an all-time high of 224.5-million bbl.

Normally, motor fuel stocks reach a peak for the year just before the end of March, but the rate of additions to gasoline stocks so far this month could indicate that the first decline of the year may not come until April.

And as refiners' stocks continue heavy, price wars continue in many areas of the country.



The Market Trend

Mexico Tries to Trade Its Way to Balance

Mexico is in hot water on residual fuel again. The Texaco deal, which took up about 30,000 b/d, was terminated on Mar. 1. The country's problem: How to sell residual fuel when everybody in the world (except on the quota-bound East Coast) has a surfeit.

Mexico for years has enjoyed a good bunker oil market on the East Coast of the U. S. Back in 1952, Pemex, the Mexican government oil agency, started selling to Paragon Oil Co. of New York. Eventually, Paragon became Mexico's best customer, frequently lifting as much as 45,000 b/d.

But when Paragon merged with Texaco last year, continued export sales to the new company seemed in doubt (PW—Sep.4'59,p52). For Texaco had its own sources of residual in the Caribbean, in Trinidad. However, Texaco tagged along with Mexico on a month-to-month supply basis—up until the first of March.

Today, Mexico has at least 30,000 b/d of residual to sell, and could move more. Pemex last month made contact with many U. S. and international suppliers. The gist of the message: If you will buy our surplus bunker "C" fuel, we will do something nice in return for you. Something "nice" might include an inside track to avgas and petrochemical markets in Mexico, plus a shot at motor gasoline on its western coast.

By offering a piece of local markets as bait, Mexico got a good response from the international trade. Officials dropped in from California Standard, Jersey Standard, and Royal Dutch Shell, plus assorted interests from France, Germany, and Japan. Today, the likelihood is strong that some of the surplus residual has already been disposed of.

Very few marketers would be interested in Mexican residual all by itself. The U. S. East Coast is locked up with a quota system. Mexican fuel oil is of poorer quality than other fuels in the Caribbean. And the latter are subject to 35¢ discounts on spot trades.

Mexico is taking a leaf from Brazil and Egypt in trying to trade its way to balance. Both Brazil and Egypt have told prospective importers: We won't buy from you unless you bail us out first. Or, as the saying goes, "You scratch my back, and I'll scratch yours."

Italy's 'Gas' Prices Off 3c:

The Italian oil agency, AGIP, cut the price of its motor gasolines by 3¢ a gal. last week. The reason: It's getting cheaper supplies of crude from Eastern Europe, notably from the Soviet Union.

Egypt Lined Up for 1960:

After several months of negotiating, Egypt lined up its oil trades for 1960, with Caltex and Sojuznefteexport the two suppliers.

Caltex will sell over 1-million tons of Arabian crude to Egypt, and will take back about 300,000 tons of Egyptian crude. The Russian agency will sell about 200,000 tons of crude, f.o.b. the Black Sea, plus some products.

Belayim Crude To the U.S.:

The most interesting crude movement this week was a cargo of Belayim (Egyptian) slated for prompt shipment to the U. S. East Coast. This is the first cargo of this oil set for U. S. delivery.

The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All prices as of March 21

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- Gasoline, 98 oct prem....11.75-12.75
- Gasoline, 92 oct reg....10.75-11.5
- Kerosine....9-10
- Heating oil, No. 2....8-9
- **Gas oil, 48-52 d.i....8.25-8.875↓**
- Fuel oil, bunker "C"....$2.00-2.10

Caribbean, cargoes
- Avgas, Grade 100/130....14.75
- Gasoline, 93 oct research prem....11
- Gasoline, 87 oct research reg....10.125
- Gasoline, 79 oct research....9.375
- Gasoline, 70-72 oct motor method....9.25
- Kerosine....9.25
- Heating oil, No. 2....8
- Gas oil, 48-52 d.i....8.25
- Fuel oil, bunker "C"....$2.00

New York Harbor, barges
- Kerosine....9.8-10.3
- Heating oil, No. 2....8.8-9.3
- Fuel oil, No. 6....$2.37-2.47

Okla.-Group 3, northern shpt., bulk
- Gasoline, 91 oct reg....11.25-11.75
- Kerosine....9.5-10.125
- Heating oil, No. 2....8.25-8.5
- Fuel oil, No. 6....$1.50-1.70

Chicago, bulk
- Gasoline, 91 oct reg....11-11.25
- Heating oil, No. 2....8.75-10.35
- Fuel oil, No. 6 high sulfur....7.15

Los Angeles, rack
- Gasoline, 88 oct reg....11.5-12.65
- Diesel fuel, PS 200....7.75-11.25
- Light fuel, PS 300....$2.80
- Heavy fuel, PS 400....$2.15-2.35

Natural Gasoline, Grade 26-70
- FOB Group 3....4.5
- FOB Breckenridge, Tex....4

LP-Gas
- Propane, Oklahoma (Group 3)....4.5-5
- Propane, Baton Rouge....5.625-5.875

Pennsylvania Lubes
- Bright stock, 25 p.t....23
- 200 vis. neutral, 25 p.t....27

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i....25-26
- Neutral, solvent, 200-210 vis....21.5-22.5

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i....25
- Neutral, solvent, 200 vis....21.5

Eastern Hemisphere

Singapore (Pulau Bukom) cargoes
- Avgas, grade 100/130....15.875
- Gasoline, 79 oct research....9.75
- **Kerosine....10.125↓**
- **Gas oil, 48 d.i. minimum....9.5↓**

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, (Okla.-Kan.), 36.0-36.9....$2.62-2.97
- North Dakota, 36.0-36.9....2.47-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9....3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9....2.92-3.22
  - West Texas, sweet, 36.0-36.9....3.00
  - West Texas, N.M., inter., 36.0-36.9....2.93
  - West Texas, N.M., sour, 32.0-32.9....2.71
  - East Texas, flat....3.05-3.25
  - Mirando, 28.0-28.9....3.31
- Illinois Basin, flat....3.00
- Pennsylvania Grade, Bradford dist., flat....4.55
- California, Signal Hill, 21.0-21.9....2.32†
- North Louisiana-Arkansas, 36.0-36.9....2.77-3.02
- Wyoming, sweet, 36.0-36.9....2.85-2.90
- Wyoming, sour, 32.0-32.9....2.63-2.71

Canada (flat prices, at the well)
- Pembina (Alta.)....$2.38
- Leduc-Woodbend (Alta.)....2.53
- Redwater (Alta.)....2.42
- Steelman A (Sask.)....2.435
- Virden (Man.)....2.30

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 47.0-47.9, Tucupido....$3.34
- San Joaquin, 41.0-41.9, Puerto la Cruz....3.10
- Oficina, 35.0-35.9, Puerto la Cruz....2.78-2.80
- Tia Juana, Medium, 26.0-26.9, Amuay....2.30
- Bachaquero, flat, Las Piedras....1.75-1.88
- Tarra, 38.0-38.9, San Lorenzo....2.83
- Lagunillas Heavy, flat, Las Piedras....2.10

†Differential per deg. of grav. varies.

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura....$1.90
- Safaniya, 27.0-27.9, Ras Tanura....1.50
- Iran, 34.0-34.9, Bandar Mashur....1.86
- Iran, 34.0-34.9, Abadan....1.81
- Iraq, 35.0-35.9, Fao....1.80
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.67
- Qatar, 41.0-41.9, Umm Said....2.05
- Neutral Zone, Burghan, 23.5-24.4, Mina Saud....1.51
- N. Zone, Eocene-Ratawi, 20.5-21.4, Mina Saud....1.38

Middle East, Eastern Mediterranean
- Arabia, 34.0-34.9, Sidon....$2.27
- Iraq, 36.0-36.9, Tripoli, Banias....2.31

Far East, Cargoes FOB Lutong, Sarawak
- Seria Light, flat....$2.57

KEY TANKER RATES

(Last paid, per long ton, single voyage)

U. S. Gulf-New York, clean..(USMC—21%) $2.25†
U. S. Gulf-New York, dirty (USMC—22½%) $2.21†
NWI-USNH, dirty....(USMC—45%) $1.51†
NWI-UK/Cont., dirty....(Scale—57½%) 13/11*
Persian Gulf-UK/Cont., dirty....(Scale—60%) 25/9*
Persian Gulf-USNH, dirty....(USMC—70%) $3.81

**Sterling*

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PETROLEUM WEEK REPRESENTATIVES

Atlanta 3 — R. H. Powell
1301 Rhodes-Haverty Bldg.
Jackson 3-6951

Boston 16 — David G. Sawyer
350 Park Square Bldg.
Hubbard 7-7160

Chicago 11 — Edward A. Callahan, Jr.
H. Sherman Davis
520 N. Michigan Avenue
Mohawk 4-5800

Cleveland 15 — J. E. MacArthur
1164 Illuminating Bldg.
55 Public Square
Superior 1-7000

Denver 2 — J. W. Patten
Tower Bldg., 1700 Broadway
Alpine 5-2981

Houston 25 — D. O. Hanson
724 Prudential Bldg.
Jackson 6-1281

Los Angeles 17 — Peter S. Carberry
1125 W. Sixth St.
Huntley 2-5450

New York 36 — David G. Sawyer
500 Fifth Ave.
Oxford 5-5959

Philadelphia 3 — W. A. Potter
6 Penn Center Plaza
Locust 8-4330

Pittsburgh 22 — J. E. MacArthur
Room 1111, Oliver Bldg.
Express 1-1314

San Francisco 4 — William C. Woolston
68 Post Street
Douglas 2-4600

Tulsa 3 — J. A. Hartley
909 Enterprise Bldg.
522 South Boston
Gibson 7-5594

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McGraw-Hill Co., Ltd.
95 Farringdon St.

DEPT/Personals

K. R. Joynt

J. Spivak

KENNETH R. JOYNT and **DR. JOSEPH SPIVAK** are new vice-presidents of Mobil Oil of Canada, Ltd., Calgary, affiliate of Mobil Oil Co. At the same time, Joynt was also elected a director, and named manager of producing for the Canadian company. He was formerly operations superintendent for the Houston exploration and producing division of Mobil Oil Co. Spivak has been manager of exploration and a director of the Canadian company since 1957.

CHESTER M. HARDEN is the new production manager, and **Fred A. Devin**, exploration manager, of Pure Oil Co., with offices in Chicago. Harden was formerly drilling and production superintendent for the Pure-Signal-Sohio group in Venezuela, and Devin was with Pure's Rocky Mountain producing division. **Stewart Cronin**, formerly exploration manager, moves to Calgary to take charge of the company's activities in Canada and Alaska. **Karl A. Mygdal**, formerly geological representative in Calgary, moves to the newly created Northern producing division headquarters in Denver. At the same time, **Joseph P. LaCroix** becomes manager of services, supervising the exploration and production division's accounting budgets, materials, and personnel matters. He was formerly assistant to Pure's vice-president for production.

QUILMAN B. DAVIS, formerly secretary and general attorney for Aztec Oil & Gas Co., Dallas, has been promoted to vice-president and general attorney. **Arland L. Ward**, treasurer, has been promoted to secretary and treasurer. At the same time, **A. E. Oldham**, independent geologist in Dallas, was elected a director.

TED B. LACAFF, JR., has joined Texas American Oil Co. as general superintendent, supervising drilling and production operations. He will be located at Midland, where he was formerly associated with Argo Oil Co. In his new position, he will work with **Nash J. Dowdie**, Texas American president, and **J. H. Bartley**, executive vice-president and chief geologist.

V. C. SCOTT has been promoted to chief geologist in the domestic producing department of Texaco Inc., in Houston. He has been assistant to the general manager of that department since 1958, and before that was assistant division manager at Tulsa.

R. L. TAYLOR has been elected vice-president and a director, and **E. J. Wacker, Jr.**, a director, of Magnolia Pipe Line Co., Dallas. At the same time, **L. E. Frensley** was elected treasurer, and **James R. Ball**, assistant secretary. Taylor, who was formerly executive assistant to **L. H. True**, Magnolia Pipe Line president, will be concerned with administrative matters. Wacker, who was named vice-president of the company last year, is involved in engineering, employee relations, purchasing, electrical, and research activities. Frensley, in addition to his new duties as treasurer, will continue to serve as comptroller. He is also manager of the Dallas accounting and service center of Mobil Oil Co., of which the pipeline company is an affiliate. Ball, the new assistant secretary, continues as manager of the right-of-way and claims department.

R. L. Taylor

J. W. Meehan

J. W. MEEHAN, formerly president of Derby Refining Co., Wichita, Kan., division of Colorado Oil & Gas Corp., becomes president of Vickers Refining Co., a newly created division of Vickers Petroleum Co., Wichita. Meehan has also been elected vice-president and a director of the parent company. Meehan, president of Derby since last year, joined Colorado Oil & Gas in 1957 as Derby's vice-president of transportation and crude oil purchasing. The new Vickers division is comprised of what was formerly the manufacturing, transportation, and marketing departments of the parent company. **James W. Vickers**, executive vice-president and a director of the parent company remains in charge of marketing, and **P. A. Blasco** continues as vice-president in charge of manufacturing.

A. O. DETMAR, president of Mobil Oil of Canada, Ltd., Calgary, has been elected chairman of the Canadian Petroleum Assn.'s board of governors for 1960. **E. C. Babson**, division manager of Union Oil Co. of California, was 1959 chairman. **J. S. Black**, president of South Saskatchewan Pipe Line Co., Regina, is the new first vice-chairman, and **E. J. Gallagher**, general manager of British American Oil Co., Ltd., Calgary, is the second vice-chairman.

M. DALE McCLURE is the new wage and salary administrator of Delhi-Taylor Oil Corp., with offices in Dallas. He reports to industrial relations manager **Al F. St. Peter.** McClure was formerly in the employee and public relations department of Sohio Petroleum Co., in Oklahoma City.

M. D. McClure

G. W. Anders

GEORGE W. ANDERS assumes the newly created position of director of financial relations for Texas Gas Transmission Corp., Owensboro, Ky. He has been director of public relations since he joined Texas Gas in 1956. In his new position, Anders will be involved in the expanded activities of the company in its relations with financial institutions and security dealers. The company's financial program is under the direction of the financial vice-president, in coordination with the corporate secretary.

R. F. HIGGINBOTHAM transfers to Houston as assistant production superintendent of Sinclair Oil & Gas Co.'s Houston division. He formerly held a similar position for the company's Midland division. He succeeds **William A. Walther, Jr.**, who becomes assistant production superintendent for the Tulsa division.

JAMES L. RUMSEY has joined Delhi-Taylor Oil Corp. at its Dallas headquarters, as administrative assistant in the executive division. He was formerly associate analyst in Continental Oil Co.'s coordinating and planning department, in Houston.

HENRY S. McQUEEN, executive vice-president, chief geologist, and a director of Salt Dome Production Co., has resigned to become a consulting geologist. McQueen, who continues with Salt Dome in a consulting capacity, has been with that company since 1951. Before that, he was associated with Aluminum Co. of America, and was instrumental in Alcoa's entry into oil and gas production.

W. L. MARTIN has been promoted to staff engineer, and **H. A. Ward, Jr.,** to senior mechanical engineer, in the technical division at Humble Oil & Refining Co.'s Baytown (Tex.) refinery. At present Martin is serving on a rotational assignment as product coordinator for the refinery's new polyolefin unit. Ward handles problems related to the development, design, and maintenance of control systems in process equipment.

PASCHAL MARTIN becomes chief engineer for Ebro Oil Co., Longview (Tex.) producing company. He has been chief production engineer at Pure Oil Co.'s Chicago headquarters for the past eleven years.

P. R. A. ENSOR is Iraq Petroleum Co.'s new chief representative and general manager for Lebanon, with responsibilities also covering IPC's operations in Jordan. **G. J. R. Tod** succeeds Ensor as chief representative for Qatar Petroleum Co., and as general manager for QPC and its associated companies in southeastern Arabia.

P. R. Ensor

P. M. Pitts

DR. PAUL M. PITTS has been appointed to the newly created position of research manager in Atlantic Refining Co.'s research and development department. He will direct basic research, applications research, and development activities. **W. A. Myers,** acting general manager of the department, continues to supervise research services and crude oil production research. Pitts, who has been engaged in fundamental research since he joined Atlantic, was most recently supervising chemist in the department.

E. G. Lindroth

G. W. Poorman

G. D. Comnas

ERIC G. LINDROTH, GLENN W. POORMAN, and **GEORGE D. COMNAS,** have been elected senior vice-presidents of Esso Export Corp., international marketing affiliate of Standard Oil Co. (N. J.). Lindroth, who is the new senior vice-president for finance, joined Jersey Standard's treasurer's department in 1932. He became treasurer and a director of Esso Export in 1948, and was elected vice-president in 1954. Poorman, the new senior vice-president for supply, joined the Jersey organization in Louisiana in 1932, and in 1944 moved to New York as assistant to the general manager, supply and transportation, for Esso Standard Oil Co. He became an Esso director on 1954, and a vice-president in 1956. Last year Poorman was named vice-president and a director of Esso Export. Comnas is the new senior vice-president for sales. He joined Humble Oil & Refining Co. in 1936, and moved to the foreign marketing department of Jersey Standard in 1945. He joined Esso Export in 1949, and later became vice-president in charge of the cargo sales department. In 1959 he was elected a director, and upon his election as senior vice-president, was appointed to the executive committee. Lindroth and Poorman were already members of Esso Export's executive committee.

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An Opportunity for Statesmanship

LOUISIANA'S GROWING IMPORTANCE as an oil state is emphasized anew in the annual report that the petroleum industry compiles on its proved reserves of liquid and gaseous hydrocarbons.

As it has in nearly all of the postwar years, Louisiana led the rest of the states in 1959 in net additions to proved reserves. And last year it edged out California as the nation's second largest oil-producing state.

The outlook for the future is even brighter, particularly for the offshore areas. An indication of Louisiana's growth potential is the fact that, in the last six years alone, the state has nearly doubled its proved reserves of liquid hydrocarbons.

BUT WITH GROWTH comes increased responsibility. During the recent years of continued surplus productivity, Louisiana has been criticized by conservation officials in other oil states, as well as by industry officials, for not sharing the burden of limiting oil production to market demand.

The sharpest complaints yet to be leveled at Louisiana came at last week's statewide hearing of the Texas Railroad Commission. A member of the commission, Olin Culberson, implied strongly that Louisiana was not "toting fair" in trimming allowables to the level of market demand. Gulf Oil's president, W. K. Whiteford, described the Louisiana allowable as "lush." And his comments were echoed by representatives of other companies.

At the end of 1959, Louisiana had 15.7% of the nation's reserves of liquid hydrocarbons. Its production for the year amounted to 13.7% of the nation's total. Texas, on the other hand, had 47.8% of the reserves, but produced only 39.8% of the total.

A few other states produced a higher percentage in relation to their reserves. Among the larger oil states, the ratio of production to the U.S. total exceeded that of reserves to the total in California, Illinois, Kansas, New Mexico, Oklahoma, and Wyoming.

But Louisiana's position as the No. 2 oil state makes it more vulnerable to attack. And the state's conservation officials have insisted on maintaining a steady position in its allowable-determining formula, which permits a steady increase in total production each month as new wells go on production.

EVERY OIL-PRODUCING state has an important stake in the well-being of the oil industry. Production in excess of market requirements—regardless of where it is produced—affects the well-being of the industry. And since such surplus production of a depleting asset is wasteful, it affects the consumers of petroleum as well.

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